103

USE OF OCS RESOURCES FOR COASTAL PROTECTION AND RESTORATION

Y 4. M 53: 103-117

JOINT HEARING

BEFORE THE

SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF

OF THE

COMMITTEE ON MERCHANT MARINE AND FISHERIES

AND THE

SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES

OF THE

COMMITTEE ON NATURAL RESOURCES

HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

SECOND SESSION

ON

H.R. 3678

A BILL TO AUTHORIZE THE SECRETARY OF THE INTERIOR TO NEGOTIATE AGREEMENTS FOR THE USE OF OUTER CONTINENTAL SHELF SAND, GRAVEL, AND SHELL RESOURCES

JULY 26, 1994

Serial No. 103–117
(Committee on Merchant Marine and Fisheries)

Serial No. 103–116
(Committee on Natural Resources)

Printed for the use of the Committee on Merchant Marine and Fisheries

U.S. GOVERNMENT PRINTING OFFICE

83–315 CC WASHINGTON : 1994

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402
ISBN 0-16-046025-5

DEC 16 1994

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USE OF OCS RESOURCES FOR COASTAL PROTECTION AND RESTORATION

TUESDAY, JULY 26, 1994

HOUSE OF REPRESENTATIVES, SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF, COMMITTEE ON MERCHANT MARINE AND FISHERIES, AND THE SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES, COMMITTEE ON NATURAL RESOURCES,

Washington, DC.

The Subcommittee met, pursuant to call, at 1:10 p.m., in room 1334, Longworth House Office Building, Hon. Solomon P. Ortiz (Chairman of the Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf) presiding.

Members present (Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf): Representatives Ortiz, Green, Weldon, and Saxton.

Members present (Subcommittee on Energy and Mineral Resources): Representatives Lehman, Farr, Allard, and McInnis.

Staff present: (Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf): Suzanne J. Waldron, Press Secretary; Robert Wharton, Professional Staff; Sheila Clark McCready, Staff Director; John Aguirre, Legislative Clerk; Katie Hornbarger, Sea Grant Fellow; Chris Mann, Professional Staff; Cynthia M. Wilkinson, Minority Chief Counsel; Lisa Pittman, Minority Counsel; Richard Russell, Minority Professional Staff; Sharon McKenna, Minority Professional Staff; and Margherita Woods, Minority Staff Assistant.

Staff present (Subcommittee on Energy and Mineral Resources): Dave Nelson, Counsel; Grey Staples, Professional Staff, Deborah Lanzone, Staff Director; and Christopher B. Kearney, Minority Consultant on Energy.

STATEMENT OF HON. SOLOMON P. ORTIZ, A U.S. REPRESENTATIVE FROM TEXAS, AND CHAIRMAN, SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF

Mr. ORTIZ. The hearing will come to order.

Good afternoon. I would like to welcome all of you here today on behalf of the Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf and the Subcommittee on Energy and Mineral Resources.

Today, the subcommittees meet to examine issues surrounding the use of Outer Continental Shelf, sand, gravel, and shell re-

sources, and H.R. 3678, a bill that authorizes the Secretary of the Interior to negotiate agreements for the use of these resources.

Sand and gravel are essential resources for the rapidly expanding populations of coastal areas in the United States and are mainly used for construction aggregate and nourishment of eroding shorelines. The nationwide annual demand for sand and gravel is nearly a billion tons. Production of sand and gravel has been increasing 2 to 3 percent a year and that trend is expected to continue. As demand increases, there is expected to be a shortage of onshore construction aggregate for coastal construction projects and coastal protection and restoration needs.

Coastal erosion, at different rates, affects all 30 coastal States and all U.S. island territories. Because coastal protection and restoration projects must compete with the demand for onshore coastal construction for these limited sand and gravel resources, there is concern that coastal protection and restoration needs may not be met. The result has been a need to find and develop new sources of acceptable quality materials from less traditional sources, such as the nearby ocean floor. A number of studies and resource estimates show that the quantity of sand and gravel on the OCS is vast, hundreds of billions of cubic meters, a huge amount compared to the national demand.

H.R. 3678, which I introduced last November, along with Chairman Lehman, Mr. Weldon, and Mr. Tauzin, authorizes the Secretary of the Interior to negotiate agreements with coastal States for the use of OCS sand and gravel for shore protection of the beach and wetlands restoration.

The bill also authorizes the Secretary to waive fees for coastal management projects primarily funded by the Federal Government. The expanded authority of this bill would be consistent with practice onshore where Federal sand and gravel resources can be conveyed under, and I quote, "free use permits" for public works projects.

The subcommittees are interested in hearing about issues surrounding the use of OCS sand and gravel resources; how implementation of this bill would affect the ability of coastal States to manage coastal restoration and protection projects; the Federal Government's administration of these resources; and implications for private industry.

I look forward to hearing from the distinguished group of witnesses that we have assembled before us today, and I thank you for being with us today.

At this time, I would like to welcome the Chairman of the Energy and Mineral Resources Subcommittee, Mr. Lehman, and yield to him to make an opening statement. My good friend, Chairman Lehman.

STATEMENT OF HON. RICHARD H. LEHMAN, A U.S. REPRESENTATIVE FROM CALIFORNIA

Mr. LEHMAN. Thank you, very much, Mr. Chairman, and thanks for the opportunity that we have here to work together to put our two committees together to work on this issue. I appreciate it, and I think we can make real progress.

As commonplace as sand and gravel resources may appear, the high volumes required for most every public works project make the availability of nearby sources critically important for rebuilding our Nation's infrastructure as well as coastal and wetlands projects.

Sand and gravel deposits which lie offshore in Federal waters can be easily transported to many of the areas in need. Unlike hauling the material by truck, where a 50-mile trip can double the cost of the material, offshore deposits can be cheaply transported and are a logical solution.

Unfortunately, the Outer Continental Shelf Lands Act does not provide the framework for transferring these materials from one branch of government to another. H.R. 3678, which you have introduced, would address this problem.

In facilitating use of offshore deposits, however, I am concerned environmental studies be performed to assure that mining sand and gravel from offshore areas is prudent. The Federal Government should avail itself of these resources, but only if the effects of offshore dredging are known.

I am also concerned about the extent to which dredging materials can be handed over to private industry without the safeguards of OCS leasing procedures and the Coastal Zones Management Act. Further, how would MMS or the Army Corps of Engineers determine the best use of offshore deposits?

I join you, Mr. Chairman, in welcoming Deputy Director Cynthia Quarterman of the Minerals Management Service of the Department of the Interior, and Deputy Assistant Secretary Dr. Morgan Rees from the Department of the Army, as well as our distinguished guests from industry, academia, and public interest groups. I look forward to discussing this issue today.

I remain open to new information regarding our ocean frontier, and I think this is a great opportunity. So thank you very much.

Mr. ORTIZ. Thank you, Mr. Chairman.

At this time, I would like to welcome the ranking member. Of course, he is always with us and he is a leader in our Subcommittee, Mr. Weldon, and I would yield to him to make an opening statement.

STATEMENT OF HON. CURT WELDON, A U.S. REPRESENTATIVE FROM PENNSYLVANIA, AND RANKING MINORITY MEMBER, SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF

Mr. WELDON. Thank you, Mr. Chairman, and let me welcome our other distinguished Chairman here today and congratulate the both of you for this joint hearing on H.R. 3678, which I happen to be a cosponsor of and which I am very excited about being involved in with my own Chairman.

As coastal populations grow, demand for sand and gravel for construction projects along the shore has exploded. This explosion threatens to eliminate affordable sources of sand and gravel for federally sponsored coastal projects such as beach replenishments and coastal wetlands restoration.

H.R. 3678 is an effort to remedy the situation by making sand and gravel from the OCS available for these public interest

projects. Currently, the Department of Interior is unable to allow the U.S. Corps of Engineers access to Federal OCS resources. Since the Corps is engaged in numerous beach replenishment projects nationwide, this restriction seems to make little sense.

H.R. 3678 allows the Secretary of Interior to enter into agreements to provide OCS sand and gravel to federally authorized projects which protect the shoreline, restore beaches or coastal wetlands. In cases where projects are primarily funded by the Federal Government, H.R. 3678 gives the Secretary the discretion to waive all fees for the resource. This authority is in keeping with public works project's free use permits for onshore sand and gravel resources.

Mr. Chairman, with beach erosion a major problem in most coastal States, H.R. 3678 could facilitate the restoration of this important natural and economic resource. I look forward to hearing our distinguished panelists today and their comments and perhaps their concerns in regard to this issue and this particular piece of legislation.

Mr. ORTIZ. Mr. Saxton, do you have an opening statement.

STATEMENT OF HON. JIM SAXTON, A U.S. REPRESENTATIVE FROM NEW JERSEY, AND RANKING MINORITY MEMBER, SUBCOMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES

Mr. SAXTON. Thank you, Mr. Chairman.

I come at this from a very personal position in that, as well as the map shows that is here before us, coastal erosion is a problem on much of the coast of the United States. And so, Mr. Chairman, I want to thank you, both Chairman and the ranking member of the Oceanography Subcommittee, for bringing this matter to the Subcommittee today.

I am, of course, most familiar with the erosion problems that take place in the State of New Jersey, my home State. The coastal areas of New Jersey from Cape May, a point where there is a tremendous problem, to Ocean City, where there is currently a municipal partnership going on with the Federal Government to replenish beach sand from near-shore sources to Harvey Cedars, to Loveladies, to all the way to the top of our coastline at Sandy Hook. Beach erosion is a tremendous problem with no seemingly simple answer. To the extent that bringing offshore sand onshore can be part of the solution, we certainly should explore that avenue.

In New Jersey as well as in many other places, we have tried many strategies to combat this problem, from offshore underwater devices that hold sand close to shore, to drains that have been built perpendicular to the shore, to sea walls that have been built to bolster the shores to dunes that we have tried to build and rebuild through natural sources. This is a continuing fight against one of Mother Nature's obviously very strong hands. And so to the extent that this issue can address some of that problem, I certainly look forward to taking part in the process and hearing from our expert witnesses today. Thank you.

Mr. ORTIZ. Let me yield to Mr. Weldon.

Mr. WELDON. Mr. Chairman, I ask unanimous consent to include the statement of Jack Fields, our ranking Republican member, in the record.

Mr. ORTIZ. Hearing no objections, so ordered.

[The statement of Mr. Fields follows:]

STATEMENT OF HON. JACK FIELDS, A U.S. REPRESENTATIVE FROM TEXAS, AND RANKING MINORITY MEMBER, COMMITTEE ON MERCHANT MARINE AND FISHERIES

Chairman Ortiz and Chairman Lehman, thank you for agreeing to hold this joint hearing on possible changes to the Outer Continental Shelf Lands Act that would aid in the use of offshore sand and gravel in coastal restoration projects.

Under section 8(k) of the Outer Continental Shelf Lands Act (OCSLA), the Minerals Management Service grants leases for nonfuel minerals on the U.S. Continental Shelf beyond the seaward limit of State boundaries (generally three miles from shore). This authority has not been used for sand and gravel, although eight other lease sales have been held since 1954. Sand and gravel is used for building and other construction activities, as well as coastal restoration and shoreline protection.

The Army Corps of Engineers conducts all the federally-funded navigation projects in U.S. navigable waters, including beach restoration and shoreline protection, and issues permits for private parties to conduct these activities. Unfortunately, existing law and policies discourage use of sand and gravel produced from Federal navigation projects or mined offshore for coastal restoration projects.

Because the demand for clean sand and gravel for construction activities and coastal restoration projects is increasing, Chairman Ortiz' bill would help to address some of the deficiencies under the existing OCSLA and other Federal laws for effective and efficient use of Federal offshore sand and gravel. Certainly, projects such as the proposed widening of the Houston Ship Channel would produce vast quantities of sand and gravel. I can think of no better public use of this material than to help restore eroding shorelines in the State of Texas.

I look forward to hearing from our witnesses today, and commend the Chairmen for working together on this issue. I hope that we can assemble this team again soon to move Chairman Ortiz' legislation reauthorizing the Deep Seabed Hard Mineral Resources Act before that resource mining law expires on September 30.

Thank you, Mr. Chairman.

Mr. ORTIZ. And, Mr. Allard, would you like to make a statement?

Mr. ALLARD. Thank you, Mr. Chairman, I do not have a statement at this time.

Mr. ORTIZ. Mr. McInnis.

Mr. MCINNIS. Thank you, Mr. Chairman, no statement at this time.

Mr. ORTIZ. All statements will be included for the record, including the statements of the witnesses before us today.

We next have Mr. Gene Green, my good friend and colleague. I might have to step out for a few moments. We have conferees on defense going on.

STATEMENT OF HON. GENE GREEN, A U.S. REPRESENTATIVE FROM TEXAS

Mr. GREEN. Mr. Chairman, I have an opening statement. I just want to thank you for calling this hearing, the joint committee and joint hearing, because it is important, particularly to those of us in Texas, because Texas is preparing to submit our coastal zone management program, we hope. The issue of sand, gravel, and shell resource is so important on the Outer Continental Shelf to us. Thank you for calling the hearing and I will submit a statement, Mr. Chairman.

Mr. ORTIZ. Thank you.

[The statement of Mr. Green follows:]

STATEMENT OF HON. GENE GREEN, A U.S. REPRESENTATIVE FROM TEXAS

I want to thank both Chairman Ortiz and Chairman Lehman for holding this joint hearing on the use of Outer Continental Shelf sand, gravel, and shell resources. I also want to welcome our witnesses who have come to testify before our subcommittees.

This hearing holds great importance to coastal States because in these States exist the greatest use of construction aggregate. The demand for construction aggregate has risen dramaticallly and has lead to an increase of the production of sand and gravel.

Passage of H.R. 3678 will authorize the Secretary of the Interior to negotiate agreements for the use of Outer Continental Shelf sand, gravel, and shell resources. This legislation will benefit States like Texas because it authorizes the Secretary to waive fees when sand and gravel resources are used in connection with coastal management projects primarily funded by the Federal Government.

Texas will soon be submitting its coastal zone management proposal for Federal approval. Issues such as the limitation of sand and gravel are significant to coastal States successfully carrying out their coastal zone management programs.

I look forward to hearing from our witnesses today and again want to thank Chairman Ortiz and Chairman Lehman for holding this joint hearing.

Mr. ORTIZ. If we do not have any other statements, I would like for my colleague, who is the ranking member of the Oceanography Subcommittee, to take over my place while I go and see if I can do something for the Army depots in my district.

Let me say that I think Chairman Lehman also has a meeting at 1:30.

Mr. LEHMAN. A very brief one but I will be back.

Mr. ORTIZ. OK.

Mr. GREEN. [Presiding.] Thank you, Mr. Chairman. I would like to begin the introduction of today's panels which consist of representatives of the Federal Government, academia, coastal States, and industry and all of whom have an interest in the issues surrounding the use of outer continental sand and gravel.

Our first panel consists of representatives of two Federal agencies affected by the implementation of H.R. 3678. The first witness is Mrs. Cynthia Quarterman, Deputy Director of the Minerals Management Service, and following Ms. Quarterman will be Dr. Morgan Rees, Deputy Assistant Secretary for Planning Policy and Legislation, U.S. Department of the Army of Civil Works.

At this time, I would like to mention that NOAA had been asked to testify at this hearing but they were not able to appear today so they will be providing written testimony for the record.

Before we begin, I would like to remind you to please limit your oral testimony to five minutes, your entire written statement will appear in the record.

Ms. Quarterman, would you begin your testimony.

STATEMENT OF CYNTHIA QUARTERMAN, DEPUTY DIRECTOR, MINERALS MANAGEMENT SERVICE, DEPARTMENT OF INTERIOR

Ms. QUARTERMAN. Thank you, Congressman Green, Chairman Lehman, members of the subcommittees. My name is Cynthia Quarterman, and I am the Deputy Director of the Minerals Management Service. I will not read my testimony here today but will ask that it be submitted for the record.

It is my pleasure to testify today in support of H.R. 3678, an amendment to Section 8(k) of the OCS Lands Act. The Minerals Management Service (MMS), as its name implies, is responsible for

the management of minerals in the Federal offshore waters. It is primarily responsible for implementation of the OCSLA. MMS is best known for its management of oil, gas, and sulfur resources in the Federal offshore. However, our responsibilities do not end there. It extends to all minerals offshore of the United States and the management of those minerals.

MMS has been actively involved with 19 States relating to OCS minerals other than oil, gas, or sulfur. Ten of those agreements are with 16 different States studying the utilization of OCS sand and gravel resources offshore of those States. Eight of those agreements relate specifically to the use of sand for beach or wetland restoration.

In 1991, we began the process of studying the use of sand, gravel, and shell resources. We first, in 1991, did a worldwide literature survey of information that was available throughout the world relating to the use of OCS sand and gravel and shell resources. In 1992, we began a study of the effects of dredging on bottom-dwelling organisms in Tampa, Florida, based on some Corps projects there.

In 1993, we began to study existing marine technology and the impacts of that technology offshore and what mitigation efforts could be made to mitigate those effects.

In 1993, we began a study with the Canadian Center of Cold Oceans Resource Engineering related to cold placer mining and its effects. In this fiscal year, or before the end of the calendar year, we plan to undertake two other studies, one relating to waive current patterns that are changed because of dredging and another relating to the evaluation of bottom-dwelling organisms and surface plumes.

Section 8(k), the amendment before you, would extend to OCS leasing a process that is already in existence onshore in the United States. It is comparable to the procedure that is carried out by the Bureau of Land Management related to the use of sand resources onshore, and this authority would extend those same processes offshore.

Section 8(k), amended, would permit negotiated agreements for public and private use of materials from Corps navigation channels, the use of materials for federally funded or authorized construction, the use of materials for Federal, State, local, and local governmental-sponsored beach and wetlands restoration projects.

It would permit the Secretary of the Interior to charge a fee on public, non-Federal, or private use of those materials from Corps navigation channel projects and for the use of materials for State or local government-sponsored beach or wetlands restoration.

As I stated earlier, we fully support the amendment to Section 8(k). MMS, as you may have realized, is not the only Federal entity that operates offshore. The Army Corps of Engineers, who is here to testify today, has ongoing projects relating to dredging, navigation channels, and other projects offshore. We believe that Section 8(k), if amended, would allow us to work cooperatively with the Corps and other Federal agencies. MMS is committed to working with those agencies through a Memorandum of Understanding to continue their current ongoing efforts in as expedited and streamlined a way as possible.

In conclusion, I would like to add that all the activities that we are interested in pursuing offshore related to sand, gravel, and shell resources would be handled under all existing environmental legislation and would have to meet the requirements of NEPA and every other existing environmental legislation and we believe that we will be able to do that.

I look forward to answering your questions. Thank you.

Mr. GREEN. Thank you.

[The statement of Ms. Quarterman can be found at the end of the hearing.]

Mr. GREEN. Dr. Rees.

STATEMENT OF MORGAN REES, DEPUTY ASSISTANT SECRETARY, PLANNING POLICY AND LEGISLATION, OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS

Mr. REES. Thank you, Mr. Chairman. I believe my full statement will take less than five minutes so I will read it.

Mr. Chairman and members of the subcommittees, I am Morgan R. Rees, Deputy Assistant Secretary, Planning Policy and Legislation, Office of the Assistant Secretary of the Army for Civil Works. I am pleased to be here testifying on this important issue.

In your letter of invitation, you requested the views of the Department of the Army on H.R. 3678, a bill authorizing the Secretary of the Interior to negotiate agreements for the use of Outer Continental Shelf sand, gravel, and shell resources. You were particularly interested in the department's views on cost-sharing and the administrative advantages or disadvantages of H.R. 3678.

Let me begin by saying that the Department of the Army supports the purpose of H.R. 3678 as we understand it. It is our understanding from discussions with Committee staff and MMS that the objectives of the bill are twofold: First, to provide authority for the Department of the Interior to enter into negotiated agreement rather than competitive bidding lease sale processes where Outer Continental Shelf sand and gravel are produced in association with a Federal navigation project or are needed for programs or projects for shore protection, beach restoration, or coastal wetlands restoration undertaken by a Federal, State, or local governments; and, secondly, to resolve a difference of opinion between the Army Corps of Engineers and Minerals Management Service that arose during planning of a storm damage protection, that is, beach stabilization, project for Myrtle Beach, South Carolina. That proposal will require removal of sand from the Outer Continental Shelf for placement on the beach in Myrtle Beach.

For purposes of clarification, I believe I should provide some background on the Myrtle Beach situation. The Corps was responsible for undertaking a federally authorized project that called for the placement of sand on the beach for storm damage protection. The Corps was proceeding with the design of the project by considering excavating sand from offshore. Minerals Management Service notified the Corps that removing the sand was subject to the Outer Continental Shelf Lands Act and that the Corps would be required to obtain the sand through the competitive lease sale process.

The Corps did not agree with this interpretation; however, we recognize that it is the responsibility of the Minerals Management Service to implement the Outer Continental Shelf Lands Act, and we give deference to MMS in its interpretation of its own authorities. Nevertheless, in our opinion, it is not reasonable for the Secretary of the Interior to be required to impose a competitive bidding process on another Federal agency before that agency can use Outer Continental Shelf sand, gravel, or shell resources to accomplish an authorized Federal project, and I stress the condition of authorized Federal project.

We believe, therefore, that the Secretary of the Interior and the Secretary of the department undertaking the authorized project should use a negotiated agreement process rather than the cash bidding process, as MMS indicates is required.

While we concur with both objectives of the legislation, we will work with the Committee to provide clarifying language with regard to the assessment of the fees that would meet our concerns.

It is extremely important that legislation to resolve these issues be enacted this year. Design and plans and specifications have been completed for the Myrtle Beach project, and the project is ready to be advertised for construction. Both the House and the Senate have added funds for construction of the project in their respective versions of the energy and water development appropriations for fiscal 1995.

As a concluding point, we believe it is important that this bill not result in unnecessary delays in Corps projects. It is important that the negotiated agreement process for the transfer of offshore sand, gravel, and shell resources be implemented in such a way to coincide with the development and approval process used for congressionally authorized Army Corps of Engineers projects. We would want to avoid a situation where the negotiated agreement step occurs after the Administration has made a recommendation to Congress and Congress has provided authorization for that project. To that end, we have had preliminary discussions with MMS concerning a possible solution involving a Memorandum of Agreement that would ensure timely coordination and cooperation between the agencies during the planning phases of Corps projects. I think such an approach could be beneficial to all of the concerned parties. Thus, I believe we can work together under a bill such as H.R. 3678 in a manner compatible to all concerned.

I would note for the record that we greatly appreciate the cooperation and courtesy shown by the Committee staff and the MMS in working to resolve these issues.

Messrs. Chairmen, that concludes my remarks, and I would be pleased to address any questions that you may have.

[The statement of Mr. Rees can be found at the end of the hearing.]

Mr. GREEN. At this time I have just a few brief questions, and then I would yield to Chairman Lehman and other members of the Subcommittee for any questions they may have.

First, Ms. Quarterman, most of the existing information for offshore sand and gravel development is concentrated overseas. How is the technology developed and the experience gained by the countries such as Japan, the United Kingdom, Netherlands, Denmark,

and France being applied for future development of the U.S. offshore sand and gravel resources?

Ms. QUARTERMAN. I believe it is being fully applied. As I mentioned during my opening statement, the very first thing that MMS did in its sand and gravel program in 1991 was to do a worldwide literature survey and it is the results of that survey we are using to develop studies going into the future.

Mr. GREEN. Thank you. One other question, Ms. Quarterman, once H.R. 3678 is implemented, how will the bill affect the steps currently required under the existing MMS lease-sale process for sand and gravel resources in terms of the public input for the area of identification, publication of an EIS, and the timing of the process?

Ms. QUARTERMAN. I don't believe that it will change those steps. I think the bill adds flexibility so that we could expedite any steps, if necessary.

Mr. GREEN. So you do not think there would be any lessening of the public ability to have input into the process with MMS?

Ms. QUARTERMAN. Absolutely not.

Mr. GREEN. OK. Thank you.

Dr. Rees, one question before I turn it over to Chairman Lehman. You indicated in your testimony that the Corps supports the objectives of H.R. 3678; namely, providing DOI with the responsibility for negotiated agreements and resolving differences between the Corps and MMS regarding projects like Myrtle Beach. Do you expect the proposed Memorandum of Agreement would resolve a concern over potential delays in Corps projects?

Mr. REES. Yes, I am confident we can reach a memorandum that would avoid any delays.

Mr. GREEN. OK, thank you, sir.

Chairman Lehman.

Mr. LEHMAN. Thank you very much and thank you both for your testimony. I would just like to ask you, each of you, about this issue of competitive bidding versus negotiated agreement, and I guess what you are getting at is allowing public entities to obtain material. Can you just expand a little bit on what the practical need for this is?

Ms. QUARTERMAN. Under the existing legislation, Section 8(k) requires the Minerals Management Service to go forward with a typical lease-sale process for the sale of or the leasing of lands for dredging, for sand, gravel, shell resources.

Mr. LEHMAN. Let me interrupt you.

Ms. QUARTERMAN. Sure.

Mr. LEHMAN. Then, what we do is similar to how leasing is done in other areas, an area is opened up for this kind of activity and then you take bids for the use of it?

Ms. QUARTERMAN. Exactly.

Mr. LEHMAN. And all things being equal, you take the highest bidder?

Ms. QUARTERMAN. Exactly. Which means that States that might want to use the resources for public uses, for public works projects, or the Federal Government which might want to use it for its projects would have to fit into the existing legislation. The amendment would provide for the Secretary to make certain negotiated

agreements that would permit him to go forward with public works projects for State, local or Federal projects that would not require this full lease-sale process.

Mr. LEHMAN. And then, Dr. Rees, under the existing regime, your agency is required to submit a bid as well?

Mr. REES. I must admit that I am not familiar with us having gone through this process. The Myrtle Beach project brought this circumstance to light, but as I understand and I would defer to MMS on what would be expected of another Federal agency, but it was my understanding that as the law and its implementing regulations currently stand we would be required to be one of the competitive bidders, essentially. I believe that is the case.

Ms. QUARTERMAN. Under the current law, MMS would have to hold a public lease-sale. In Corps projects, there are usually State or private entities behind any given project and I don't know what the case is in the Myrtle Beach project, but in that instance, as onshore, when a private company or a State wants to use sand in its projects it would be their responsibility to come to us and secure a lease.

Mr. LEHMAN. And so as you interpret the law, then, that is regardless of the purpose of the project?

Ms. QUARTERMAN. That is correct.

Mr. LEHMAN. Director Quarterman, you mentioned that the MMS is conducting a number of studies examining the environmental effects of offshore dredging. When do you expect those to be finished?

Ms. QUARTERMAN. With respect to the literature survey, we have already completed it. The benthic repopulation study, which relates to bottom-dwelling organisms, should be finished next year. The marine mining mitigation study, which relates to mining impacts and mitigation, should be finished this year. And the other two studies that I mentioned, the wave pattern study and the other benthic study, will begin this year and is expected to go on for about two years.

Mr. LEHMAN. Would it be wise to go ahead with these incentives without finishing those studies first?

Ms. QUARTERMAN. I think the studies will be completed in an expedited basis. I don't know what the timing is on the Corps project. But the most important study will be finished this year and we will be able to move forward.

Mr. LEHMAN. So you are saying you will have the important ones done. What is the important one?

Ms. QUARTERMAN. The important one is the repopulation study being done off the coast of Florida.

Mr. LEHMAN. And it is not your intent to go forward, then, without the benefit of that study?

Ms. QUARTERMAN. I believe that is correct.

Mr. LEHMAN. For oil and gas leasing under the Outer Continental Shelf Lands Act, coastal States do have some input into the decisionmaking process via what we call the consistency provision within the Coastal Zone Management Act. In that the proposed legislation would allow the Secretary to avoid leasing, per se, would the consistency provision of the Coastal Zone Management Act apply to sand and gravel mining?

Ms. QUARTERMAN. Yes, it would, and I might add that MMS is already working cooperatively with many, many States, and we are well on our way to reaching agreement on any concerns they might have. Certainly through the coastal zone management process we would also continue to cooperate with the States.

Mr. LEHMAN. Finally, what kind of input or concerns have you heard of from the fishing industry?

Ms. QUARTERMAN. I don't believe that we have had many contacts with the fishing industry. That is certainly something that would be considered during the process of determining where mining would be permitted and we would try to mitigate any of their concerns.

Mr. LEHMAN. Thank you very much.

Mr. GREEN. Thank you, Mr. Chairman.

Now I would like to yield five minutes to Congressman Saxton.

Mr. SAXTON. Mr. Chairman, thank you very much. I have three, I think, relatively simple and quick questions.

First of all, with regard to the bill that we have here today, do you see any administrative problems; and, if so, do we need to do anything to address them?

Ms. QUARTERMAN. None that I can discern.

Mr. SAXTON. So everything as far as the agency is concerned, everything looks like it is workable and does not cause undue hardship.

Ms. QUARTERMAN. That is correct.

Mr. SAXTON. Good. Second, with regard to the practicality of implementing the process of extracting sand on the shelf and bringing it onshore, knowing what you know about technologies that exist, that were mentioned here by somebody elsewhere in the world, is it practical, in your opinion, to think that this could be a major part of the solution to beach restoration?

Ms. QUARTERMAN. I think that is our hope. I think it is a practical solution. Many beach restoration projects that have been ongoing to date have concentrated on removing sand in State waters, which is very close to shore. And because of the tidal effects, my understanding is, from our scientists, that the sand continues to be pulled back offshore because the removal site is so close and it creates a vacuum and removes the sand again. By going farther offshore, it is my understanding that the restoration would last for a longer period of time and be much better.

Mr. SAXTON. Just a follow-up on that second question, you are right, Ocean City in New Jersey, for example, has an ongoing and extensive dredging program and beaches are nourished and replenished and are in good shape. I think it is a fair statement to make, however, that that is a huge burden on that relatively large community.

Also, in my district is the town called Loveladies, which is a very sparsely populated town with a very small tax base, so that the local government would have a very difficult time in meeting the same problem because of resources available to them and a very long coastline. And so our experience with near-shore dredging has been a mixed one because of the economics involved in getting it done.

And so I guess my concern here is if it is a problem for near-shore dredging and communities affording to be able to carry out the program, is it not also a much more serious economic issue if we go offshore?

Ms. QUARTERMAN. I think that is up to each individual State and community to determine whether the economics of the project is viable for them. I think the fee charge in the new legislation makes it much more affordable for States and local communities to have access to offshore areas.

Mr. SAXTON. Well, I hope you are right. I just have this vision of an offshore dredge and a barge and then getting the material off the barge onto the shore being a much more complicated process than what we have seen as a successful process in Ocean City, New Jersey. But I hope you are right because I want this to be an answer.

Finally, the third question has to do with the environmental impact offshore. I take it the concerns are offshore life on the bottom and you also mentioned some surface issues. Can you expound on those somewhat?

Ms. QUARTERMAN. Well, to the extent of my expertise, which is little, I understand that there are some microorganisms that live on the ocean bottoms, and we have been doing studies to show the effects of dredging and how long it would take for those organisms to repopulate in those areas. Above the bottom there are also other organisms that are alive and might be affected by dredging.

Mr. SAXTON. Just as a final follow-up on the environmental question, I would suspect that the amount of mining offshore, would have something to do with the environmental impact. In other words, this goes back to my second question. If this process proves to be economical and doable, then one might expect to see a great deal of effect as a result of a lot of dredging. On the other hand, if, as some might suspect, it is going to be very expensive and difficult to do, then that would certainly lessen the effect over the environment. Are those things taken into consideration?

Ms. QUARTERMAN. Those things will be taken into consideration when we do an environmental impact study on the area, both the economics and the environmental effects.

Mr. SAXTON. Thank you very much.

Mr. GREEN. Congressman Allard.

Mr. ALLARD. I come from a State that has not had any coastal area for some time, Colorado. Thousands of years, as a matter of fact. But I do have a couple of questions.

The first question has to do with the process and the ability to raise objections during public hearings and whatnot. Does this piece of legislation make it easier for opponents to raise technical concerns that may unnecessarily delay a project, for example?

I don't have a problem with concerns being raised during the hearing, as long as they are sincere and not just trying to be an obstructionist for one reason or another. Does this make it any different and with the rules that we are dealing with now?

Ms. QUARTERMAN. No, it does not. The effect of the legislation is merely to change the means by which the Secretary can convey the resources. It does not affect the process itself.

Mr. ALLARD. OK.

The second question I have is—in many States they have a property tax value. And I would assume that dredging operations in the private sector have to pay a property tax value in some way or another to their local governments. Sometimes, when you do something like this, and give, for example, a municipality or the Federal Government a break in the competitive process, you do not pay property taxes but maybe the company that is doing this work does. So there is a shift of tax dollars, maybe from education to the Federal Government or from education to maybe a municipality or a county. Does this happen with this particular piece of legislation?

Ms. QUARTERMAN. Will property values change; is that the question?

Mr. ALLARD. Well, let us take a State that relies on property taxes to pay for education, and as an entity, you do not pay property taxes because the Federal Government is exempt from that. So when you can go in and you get exempt from having to pay the fees and exempt from having to compete in the competitive process, that means that that service is not provided by the private sector.

Now, we know the private sector pays property taxes locally. So what that means is that there is a shift of tax value from the private sector to the Federal Government. You do not pay property taxes, they do. It could have an indirect impact on funding education at the local level, for example. Do you see that?

Ms. QUARTERMAN. I think perhaps Mr. Rees is best suited to answer that question since it is his organization that would be doing the projects, but just briefly, I believe it is Congress that determines whether or not Corps projects go forward, and I don't know if that is part of the analysis that is done in that process or not.

Mr. REES. I certainly cannot represent myself as a tax expert, but in Corps—if you are talking about a Corps project where the source of the material for beach stabilization is either from the Outer Continental Shelf or from some other source, the only role that is played in that in terms of the economics is how much the resource is worth. And I am not sure how any tax circumstance would be changed. But, frankly, we had not considered that.

I believe the answer is that there would be no effect. But let me give that some more deliberate thought and provide you an answer for the record, if you would like.

Mr. ALLARD. I would appreciate that, thank you. That is all, Mr. Chairman.

Mr. GREEN. Thank you.

[Mr. Rees submitted the information below following the hearing.]

Question: Does H.R. 3678 cause a reduction in the property tax receipts by local governments?

Answer: As far as Corps of Engineers projects are concerned, we do not believe there will be an impact on local government property taxes. Corps projects are performed by private contractors in a competitive bidding process, and this will not change when the construction material (sand) is obtained from the Outer Continental Shelf. Under current procedures, the sand for storm damage reduction projects that is obtained from the near shore area is furnished at no cost to the project. Under H.R. 3678, there will be a similar procedure when sand would be obtained from the Outer Continental Shelf for use in a storm damage reduction project. The Minerals Management Service would enter into an agreement with, for example, the Corps of Engineers to allow use of the sand at no cost to the project.

Mr. GREEN. I would like to thank each of the Federal agencies for coming here today and sharing their insights on issues surrounding the Outer Continental Shelf, sand, and gravel and H.R. 3678.

Several of the Subcommittee members, as you can tell, had to leave and they have additional questions for the witnesses and we would like to be able to submit them in writing. Thank you for your testimony, and we will pause for just a brief minute while our second panel is seated and our staff reorganizes. Thank you, Ms. Quarterman and Dr. Rees.

Ms. QUARTERMAN. Thank you.

Mr. GREEN. I would like to introduce the second panel that is here today and consists of representatives from coastal States, academia, and industry.

First, we will hear from Dr. Robert Jordan, State Geologist at the Delaware Geological Survey; the second witness is Mr. James Chisholm, City Manager from the city of South Padre Island, Texas; and next we will hear from Dr. Orrin Pilkey from Duke University; following Dr. Pilkey, we will hear testimony from Mr. George Banino, Vice President of Rust Environment and Infrastructure. Mr. Banino is testifying on behalf of the National Aggregate Association.

Before we begin, I would like to remind each of you to please limit your oral testimony to the five minutes and your entire witness statement will appear in the record. We will begin with Dr. Jordan. Dr. Jordan, you may begin your testimony.

STATEMENT OF ROBERT JORDAN, STATE GEOLOGIST, DELAWARE GEOLOGICAL SURVEY

Mr. JORDAN. Thank you, Mr. Chairman, members of the subcommittees, and ladies and gentlemen.

I am Robert R. Jordan. I am State Geologist of Delaware, Director of the Delaware Geological Survey, and a Professor of Geology at the University of Delaware. I appreciate very much this opportunity to offer some comments on the technical aspects of coastal geology in support of H.R. 3678 and the general objective of facilitating access to sand resources.

Along much of the coastline of the United States, as you know, and certainly in my State of Delaware, sandy shores are intensely used and are major economic resources. They are also, in geologic terms, delicate, active features that adjust to the forces of tides and waves and wind to produce a state of dynamic equilibrium along the coast.

A relative rise of sea level on the land is a powerful overriding force in Delaware's beaches and many others. The response of sandy coasts to the sum of such force is migration in a landward direction, that is, what we perceive as erosion.

Fundamentally, there are only three kinds of reactions to this. As you know, we can retreat, which is good geologic advice but is not always practical for economic reasons; we could build structures to try to resist the forces acting on the shore; or we could nourish the shore by artificially supplying what is really sacrificial sand to compensate for that moved and removed by natural processes.

At various times and places we have used all three of these actions. Nourishment is the preferred action in some of our areas in Delaware. In my experience, we have taken sand for beach nourishment from mines on land, from lagoons behind the beaches, from the flood tide delta of an inlet, from shoals offshore in State waters. Sources of sand in the appropriate quality and quantity are being depleted and there are, of course, many competing uses for the land.

Thus, the search for nourishment sources must extend farther seaward. An artificial barrier exists, though, in the form of a boundary between State and Federal jurisdictions three miles offshore. And I am particularly sensitive to that because I have served as chairman of the State Boundary Commission in Delaware for more than 20 years and we have debated many issues at that interface.

Our situation is not unusual. During my recent term as chairman of the Outer Continental Shelf Policy Committee of the Department of the Interior, we approved and sent to the Secretary a report on these resources offshore, and there are three points I would like to extract from that because I believe they are particularly pertinent here.

First, we found that offshore sand is presently being used for beach nourishment, and the demand will increase significantly in the near term. Second, offshore supplies of beach nourishment sand and aggregate are sufficient to meet specific market demands and could provide resources environmentally preferable to onshore alternatives. Third, the report recommended the concerned parties should work together for the development of new legislation to allow these resources to be utilized, and I commend you on the efforts that are going forward here today.

We have sufficient scientific understanding of beach processes and the distribution of sand resources to demonstrate that an access to the Federal OCS is desirable for shoreline restoration and protection. The technical studies that support such conclusions have in part been funded by the Minerals Management Service, which was commendably farsighted in stimulating State investigations of processes and resources. Ironically, that support, in part, now appears to be a casualty of shortsighted budget reductions. We hope that the science will be encouraged to keep pace with the opportunities that good legislation may provide.

I am particularly pleased here today to report the Association of America State Geologists, representing my colleagues, the directors of over 50 State geological surveys, supports H.R. 3678. AASG's position statement, which I would ask be appended to my testimony—and I regret it was not available in time to submit it with the rest of the material—that testimony from the Association says that, "the Association judges that the passage of this bill would positively serve the needs of the coastal States in addressing shoreline erosion problems... We urge enactment of H.R. 3678".

A very real need exists and it is desirable to provide the administrative mechanism to address it. The bill before you would permit a reasonable option for dealing with the sensitive critical areas that are a sandy coast.

I thank you very much for your interest, and I will be pleased to respond to any questions and welcome any opportunity to document the remarks. Thank you, Mr. Chairman.

Mr. GREEN. Thank you, Dr. Jordan.

[The statement of Mr. Jordan can be found at the end of the hearing.]

Mr. GREEN. Our next witness is Mr. Chisholm. Mr. Chisholm, welcome, from South Padre, having spent many a time there with my children over the years. It is a beautiful beach. You may proceed.

STATEMENT OF JAMES CHISHOLM, CITY MANAGER, CITY OF SAN PADRE ISLAND

Mr. CHISHOLM. Thank you, Mr. Chairman, and distinguished Committee members. I appreciate the opportunity to share with you some of our thoughts about beach erosion and how it impacts South Padre Island. But, first, for those of you who are not aware of where South Padre Island is, I might give you a little background. South Padre Island is a community that enjoys 6 million tourists each year. We are located on a barrier island in south Texas, about 25 miles north of the Mexican border.

Being only 25 miles from Mexico, we have a diverse tourist population that is international in nature. Our economy is based primarily on tourism, which is very dependent on the beaches as a resource. Our tax base is a healthy $500 million and is based directly upon the beaches.

Recent studies have shown that the northern beaches erode at an annual rate of 10 feet a year. We recognize the importance of beach nourishment and are currently participating with the U.S. Corps of Engineers in a Section 933 project out of the Galveston office. The U.S. Corps of Engineers currently maintain the intercoastal waterway and the Brownsville shipping channel. Our studies of beach and dune conditions on South Padre Island, Texas, by Dr. Robert Morton, indicates maintenance dredging material is one source which would provide beach quality sand for beach nourishment.

A second source of beach quality sand is identified as the seafloor off South Padre Island in the Gulf of Mexico. Foundation borings and surface sediment samples of the Inner Continental Shelf show that thick sand deposits are located in about 50 foot of water.

H.R. 3678 would allow the local units of government, in conjunction with the Federal agencies, an opportunity to utilize federally controlled resources, which could aid in the restoration or protection of the Gulf coast communities; and offshore sand resource may prove to be the most feasible opportunity for our community to replenish our beaches.

Be happy to answer any questions you have, Mr. Chairman.

Mr. GREEN. Thank you, Mr. Chisholm.

[The statement of Mr. Chisholm can be found at the end of the hearing.]

Mr. GREEN. Dr. Pilkey, you can begin your testimony.

STATEMENT OF ORRIN PILKEY, DEPARTMENT OF GEOLOGY, DUKE UNIVERSITY

Mr. PILKEY. Thank you, Mr. Chairman.

I would like to address a different aspect of the Continental Shelf mining. First of all, the good news is that it certainly would reduce the environmental impact. The current near-shore mining, some of which goes on in less than a thousand yards offshore by the Corps of Engineers for beach replenishment, is doing a lot of damage, I believe. The Dutch are so concerned with this that they require major mining for beach replenishment to go on at least—more than 20 kilometers, or more than 12 miles offshore.

The bad news is that every continental shelf is different; every inner continental shelf is extremely different with regard to orientation, the wave climates, the currents, the shell content, the fauna, the flora, the width of the Continental Shelf. And what this means is that the principles and approach to environmentally sensitive dredging will vary dramatically from place to place.

In this sense, I think I might disagree somewhat with Deputy Director Quarterman's statement that a study off Florida of what is coming back to repopulate the areas after dredging may not really be that important because it only relates to that one area.

We have a lot of mud problems associated with dredging. Even though the dredge sand may have a very low mud content, it tends to be all released at once, either during the dredging operation or when it is emplaced on the beach. And this means that we have a short-term mud problem during dredging operations. And I talk about one of these with regard to Palm Beach, Florida, that occurred recently, in my written statement.

And we have a longer term mud problem because of mud that accumulates in depressions. And it appears that depressions offer a shelter for mud, shelter it from wave energy, and the mud may accumulate for decades and then all of a sudden be released during an important storm. And I offer an example, an anecdotal possible example of that occurring off Long Island.

Depressions also change the direction of waves and they also change and increase the wave energy that is striking the shoreline. Of course, we are mostly concerned with the effects on the fauna and flora. The effect on the fauna and flora in south Florida will be profound. We have examples of serious damage done to fauna and flora by dredging off Miami Beach. We have an example of a mud problem from a Boca Raton dredging. And even things like off Boca Raton; 300 yards of a large linear coral reef area, not quite a reef but a collection of coral heads, was substantially damaged by the dragging of an anchor from a dredge.

I believe if the public knew the amount of damage that has been going on off south Florida on the hardground areas, there would be a lot of opposition to offshore dredging.

In the unconsolidated sediment, the damage is less obvious and much less well understood. Recently the mayor of Virginia Beach argued that dredging would be good off sand beds where the bottom is very flat and it would create new habitats for organisms. Hard to say. It is hard to improve on nature.

Another problem is that we do not understand the inner shelf. We are just now beginning to understand storm-driven currents, and storms really do everything. Current models, both mathematical and conceptual, assume there are no bottom currents, basically. No strong bottom currents. They assume there is a closure depth

offshore, a depth beyond which no sediment moves offshore and not much moves onshore. And this closure depth has been used to choose dredge sites in the past. But we do not believe now that this closure depth exists or anything close to it exists.

Finally, we cannot predict the problem. We cannot predict accurately, using mathematical or any other kind of models, exactly what a depression will do. We cannot predict the wave refraction patterns nor can we predict ahead of time the mud dispersal problem which makes the accurate Environmental Impact Statement very difficult.

The bottom line is, in my view, that we should not just give carte blanche permission to mine the Continental Shelf. We have to recognize the vast difference and the potential impact of mining on different kinds of continental shelves. We need some studies, but I think most of the studies that have been done in the past, the ones I am aware of, are not appropriate to answer some of the critical questions about biological impacts. And if we do allow mining on the outer shelf, we need regulations that are locally oriented; regulations that have been drafted by genuine Continental Shelf oceanographers, marine geologists, chemical oceanographers, physical oceanographers, and biological oceanographers. Thank you.

Mr. GREEN. Thank you, Doctor.

[The statement of Mr. Pilkey can be found at the end of the hearing.]

Mr. GREEN. Mr. Banino.

STATEMENT OF GEORGE BANINO, VICE PRESIDENT, RUST ENVIRONMENT AND INFRASTRUCTURE ON BEHALF OF NATIONAL AGGREGATE ASSOCIATION

Mr. BANINO. Thank you. Mr. Chairman and members of the subcommittees, thank you for the opportunity to appear before you and testify on H.R. 3678 which would give the Secretary of the Interior the ability to negotiate agreements for the use of OCS sand, gravel, and shell mineral resources.

Speaking today from my 24 years of experience working with the construction aggregates industry as a consultant, and work throughout the United States with emphasis in the northeastern part of the country, I am here also representing the National Aggregate Association, which is one of the largest industry associations representing the construction aggregates industry and its suppliers. In addition, I am a member of the Department of the Interior's OCS policy committee and have just recently been named to the chairmanship of its OCS hard minerals subcommittee.

In your invitation to me to attend this hearing you asked that I review H.R. 3678 from the point of view of the aggregate industry.

The construction aggregate industry produces sand, gravel, crushed stone, and shell for a wide variety of construction purposes and it is one of our most basic mineral resource industries. These minerals are used for virtually every construction project from the largest to the smallest. The ability to produce high quality, low cost construction aggregate is necessary to support our Nation's growth and the expansion and maintenance of our infrastructure at a reasonable economic cost. Further, this mining industry must be able

to produce its products in a way that minimizes environmental impacts and avoids land use conflicts to the greatest extent possible.

Traditionally, these mineral resources have been mined from land-based deposits. In heavily populated areas, such as along the coastlines, the need for sources of construction aggregates close to the markets has created an increasing land use conflict situation. Such conflicts have lead to restrictive zoning, lawsuits, and escalating permitting costs. In some areas, long established mineral deposits of construction aggregates have been mined out, creating the need to transport these high bulk, low cost materials long distances at high costs. Finally, in some areas, there are no suitable deposits for the production of construction aggregates, leading to the importation of these materials from other parts of the country or in some cases from foreign countries.

It has long been recognized that alternative sources of construction aggregates, especially sand and gravel, exist on the Outer Continental Shelf that have the potential of meeting the demands of both land-based construction and beach restoration. Two countries, Japan and the United Kingdom, have been leading the way in the use of OCS sand and gravel, where significant percentages of their construction aggregate needs are met by offshore mining. By using those resources, these island nations reduce the demand on their land, and shift many of the environmental impacts inherent in mining away from their population centers. This is not to say that they are not concerned with environmental impacts. In both cases, such impacts have been studied intensively and strict controls are imposed to minimize impacts on other natural resources such as water quality and fisheries. Experience has shown that the use of the mineral resources can be compatible with other natural resources.

The existing requirements of Section 8(k) of the Outer Continental Shelf Lands Act for cash bonuses and bids to obtain the right to OCS mineral resources has proved suitable for oil and gas, but are inconsistent with the financial structure and experience of the construction aggregate industry. This industry will want assurance that it has the ability to mine a particular site before it makes a large investment in exploration and development. In my own experience, the present bid system has discouraged construction aggregate industry members from seriously considering OCS resources.

H.R. 3678 provides an alternative approach for the use of OCS mineral resources. By providing the ability to negotiate a fair agreement before extensive exploration and development costs are expended, the construction aggregates industry can consider OCS resources as an alternative to onshore resources. In some cases, particularly along our coastlines, this can be a cost-effective alternative.

The greatest use of construction aggregates is in road construction. Virtually all highways are built with Federal, State or local government funding, and a lower cost source of material will lead to lower project costs. Many other large scale projects are funded to some extent on approval by Federal agencies, and they too would benefit from lower cost construction aggregates.

H.R. 3678 opens the way for the development of OCS mineral resources beyond oil and gas so that hard mineral resources on the

OCS can serve the public interest. On behalf of the construction aggregate mining industry, I urge the committees to act favorably on this bill, and I would be pleased to answer any questions. Thank you.

Mr. GREEN. Thank you, Mr. Banino.

[The statement of Mr. Banino can be found at the end of the hearing.]

Mr. GREEN. I would like to ask a few questions, then yield to Chairman Lehman and members of the Subcommittee.

First of all, Dr. Jordan, you heard Dr. Pilkey's testimony that there is difficulty in characterizing offshore sand and gravel resources. And where do you feel we are in terms of our ability to properly assess the nature and the quality of the offshore sand and gravel resource deposits?

Mr. JORDAN. Mr. Chairman, that information is not uniform around the coast. There are some areas of ignorance, to be sure, and there are others in which the resource is fairly well-known. I would say that, as characterized in the report of the OCS Policy Committee, we have general knowledge of the resource. We know it is a resource. We know it is generally there, and, of course, there should be very site-specific studies for particular projects.

Mr. GREEN. In follow-up, and any of the panel may answer, one of the concerns in the testimony was that we have some type of limit, like after 12 miles, or something like that, and you may just address that during the questions. Do you feel like there is some artificial limit we should set, that we do not want Outer Continental Shelf mining from a certain mile inland or something like that because of the damage?

Mr. JORDAN. No, sir, we have an artificial limit now in the constraint of the 3-mile interface between State and Federal waters, except of course off Texas and the west coast of Florida. Now, we are mining in Delaware. In fact, today, the last grain of sand will fall on Dewey Beach, which may be familiar to some of you, from the offshore. And that mining is going right out to the 3-mile limit but it cannot go across it, which means that we are limited in our choice of sites to those which may not be of the highest quality and which, in fact, may not be the most environmentally desirable.

So we would like to see that barrier relaxed somewhat so that we may indeed consider the sites beyond 3 miles.

Mr. GREEN. Thank you.

Dr. Pilkey, your testimony seems to suggest that beach replenishment and dredging activities have short- and long-term implications for the creation of mud problems offshore. Have you found this to be a problem in the United Kingdom or the Netherlands in their sand and gravel programs?

Mr. PILKEY. I am unaware of the studies in the United Kingdom regarding this. In Holland, I understand from my participation in an NRC panel on beach replenishment that one of the reasons that they go so far offshore is because of their concern for that minor amount of mud that is often in sand, and because of their concern for that hole and the effect on the wave pattern. And so they feel if they are 12 miles or more offshore for major mining they will avoid those problems altogether. That is a long ways offshore.

Mr. GREEN. Thank you. I would like to recognize Chairman Lehman now for any questions he may have.

Mr. LEHMAN. Thank you very much, Mr. Green.

Mr. Jordan, you mentioned that the sea level is rising and you quantify that in your statement, which I looked at. It is rather interesting. Are there any signs that it is rising more rapidly now than it has in the past?

Mr. JORDAN. The rate, Congressman, the rate of sea level rise will vary from place to place. For the shoreline that I am most familiar with, the studies, in my view, are not completely definitive. It is probably not rising quite as fast as it has in the geologic past. But for practical purposes, I think we can characterize it as a relative rise as a foot a century, as I mentioned in my testimony.

I would also note that this has been going on for about 12,000 years, so it is not likely to stop by the end of this beach season.

Mr. LEHMAN. There is not much we can do about it, I understand that. And does that mean that we are going to have to have beach nourishment projects indefinitely as the sea level continues to rise?

Mr. JORDAN. Congressman, if we wish to hold the line, if we make that determination, then you would have to continue this indefinitely.

We have mixed policies in Delaware. More than half of our Atlantic shoreline has been acquired by the State and is in State parks. We have made the policy decision that we will not attempt to defend the State parks. They will benefit from some of the natural drift of the sand along the coast, but we feel that the retreat policy is the appropriate one on those properties.

If, however, the local communities choose to defend their areas through nourishment, then we feel a responsibility to help them acquire the material that is best suited to that job.

Mr. LEHMAN. Are there any estimates as to how much of that material will be needed over the next, pick your timeframe, 10, 20, 30 years; 100 years?

Mr. JORDAN. Yes, Congressman. We have made some of those estimates and of course there is a study under way by the Corps of Engineers at the moment which should help to quantify that for the entire coast.

Mr. LEHMAN. And those are available?

Mr. JORDAN. Oh, yes.

Mr. LEHMAN. Thank you.

Dr. Pilkey, your testimony mentions that muddy sediments that are a by-product of dredging can be hazardous to some organisms. Could you provide some detail as to what life might be jeopardized?

Mr. PILKEY. I am not a biologist. But it is my understanding that the organisms at most risk to mud tend to be those that are on hardgrounds or on rocks or that were static, like reefs, coral heads, and worm reefs in south Florida. They cannot get out of the way and they feed by filtering the water and they are suffocated when there is too much suspended material in the water or when they are covered by the mud. This is why the south Florida area, most of the Florida peninsula on both sides is the most susceptible to this mud problem.

Mr. LEHMAN. Do you concur with Dr. Jordan's comment about rising sea level being one of the major factors causing erosion?

Mr. PILKEY. Oh, I think so. It is very difficult to quantify this but almost certainly it is one of the major problems, and in my opinion because the sea level is rising, not only will the need for replenishment sand continue but it will accelerate because, in theory, the rising sea level should cause a loss, in general, the loss of replenished beach even more rapidly than at present.

Mr. LEHMAN. Mr. Banino, is the construction aggregate industry currently mining sand and gravel in State waters?

Mr. BANINO. The only example of that is in the State of New Jersey, where a company is dredging the Ambrose Channel which is the main channel into the New York Harbor, through an agreement with the Corps of Engineers, and that material is being brought onshore. It is being processed onshore and being sold into the New York City metropolitan market, where it is one of the major sources of sand for the construction industry in that market.

Mr. LEHMAN. In general, is it economic to dredge, process, and transport OCS material?

Mr. BANINO. Probably the best answer to that is that it comprises a major portion of the construction sand industry for the United Kingdom, for example, where it provides about 15 percent of that resource. And in Japan it provides about 25 percent of that resource. And it does that very competitively. I think in the U.S. waters, under the right circumstances, it can be very competitive certainly for the coastal States.

Mr. LEHMAN. As we mine out our sand and gravel deposits near these major metropolitan areas, what other types of onshore deposits are we using in the industry to replace those?

Mr. BANINO. The onshore supply of construction sand and fine aggregate sand and course aggregate would either be gravel or crushed stone. It's being supplied by onshore resources that traditionally have been close to the market, but as you said, as they are being mined out, the most immediate alternative is to go further away from the market and then transport that material into the market either by truck, by rail, in some cases by barge at a considerable cost over mining from a closer resource.

In some cases, the fine aggregate, the sand, is being replaced by crushing down rock to produce what is called manufactured sand at a considerably higher cost than natural sand.

Mr. LEHMAN. Do you need to build any new infrastructure facilities to process sand and gravel from offshore?

Mr. BANINO. The answer is that in many markets there would have to be new infrastructure to off-load the material that was mined from the Outer Continental Shelf. The question would have to be answered about whether that material would be processed offshore or brought onshore as it is recovered from the bottom of the ocean and then processed on land.

In some market areas, for example in a small way in New York City, in a small way in Norfolk, Virginia, there are some of those infrastructures already available. Aggregates are being imported into the States by oceangoing ships and coming in onshore and there are some infrastructure facilities available. But if this became a viable significant resource, there would certainly have to be new infrastructures constructed, yes.

Mr. LEHMAN. What is the key to it becoming a viable significant resource?

Mr. BANINO. Ultimately, determining the economics. One of the short-term problems is the uncertainty of the current process of going offshore. Part of that is the question of being able to mine a property where there is a significant amount of exploration done and that gets right to the issue of Section 8(k) of OCSLA and the purpose of the Ortiz bill.

Other issues have to do with the distance offshore, the type of equipment that would be used, the kinds of constraints that might be imposed on the mining that might or might not add to the cost of that mining.

Mr. LEHMAN. So it is rather uncertain, but possible.

Mr. BANINO. Well, again, I have to point to other countries where it is being done quite economically, and under the right circumstance I think those same economics can apply here as well.

Mr. LEHMAN. With environmental regulations?

Mr. BANINO. With environmental regulations, you are asking me?

Mr. LEHMAN. Yes.

Mr. BANINO. I think so, yes.

Mr. LEHMAN. OK, thank you, Mr. Chairman.

Mr. GREEN. Thank you, Chairman Lehman. Congressman.

Mr. FARR. Thank you very much, Mr. Chairman. Thank you for inviting us to this joint hearing and this is my first opportunity to get into this issue as a new Member of Congress and it is one of interest to me.

I represent a lot of coastline in California. We have shut down some sand mining operations because of the effect it has had on the coastline and the detrimental effect on the lateral cell development for retaining the beaches. So I am just curious, and I have just a question, and perhaps I am here a little too late for the original panel of Federal spokespersons, but I was just curious, perhaps one of the panelists can tell me, do you think from a resource management standpoint that we have really tackled this in the proper way? It seems to me that we do not really look at the resource, regardless of where its boundaries are; that we have kind of given a green light to the resource if it is inside the 3-mile zone, but not looking at what the resource development potential is for the entire exclusive economic zone which goes out to 200 miles.

Perhaps, what we really need to do is be mapping the resources and master planning the ocean for how we develop those resources rather than holding on to the near-shore resources, which may have detrimental effects near-shore, such as beach erosion, coastal erosion, and so on. So perhaps as a policy, and of course people will argue if you go offshore longer, it is going to be more costly, but that is only looking at the cost of dredging, not the cost of the adverse environmental impact.

So I am just curious from an industry standpoint and from a local government standpoint and State and local government whether the panelists think that perhaps we ought to have a different policy about analyzing, mapping the resources, and developing kind of a green-light red-light attitude toward those resources; that wherever they are they can be safely mined; that we make the permitting sales rather rapid; and where they should not be mined

we just say that is off the realm of possibility and we have done that a little bit with the oil but we have not done that with the mineral mining that you are talking about, and I would be curious to your reaction to that. Anyone. Dr. Jordan?

Mr. JORDAN. Thank you, Congressman. I quite agree with your assessment. We should be mapping these areas much more intensely. And in fact of course that is going on at the present moment. We do need additional detail in the areas that are going to be candidates for mining.

Mr. FARR. Is that mining done like it is for oil, where the industry maps or does their own and then we in the Federal Government also do our mapping and kind of compare notes?

Mr. JORDAN. Well, I am more familiar with the oil and gas process because of course that has been done off all of our coasts. And the sand and gravel mining has not. But as I mentioned in my prepared remarks, there have been some studies, both by the States and with the support of some of the Federal agencies, particularly Minerals Management Service, that have encouraged us to look more carefully at this. For example, and this is our latest report from the Delaware Geological Survey in part supported by the Minerals Management Service and in cooperation with our counterparts in Maryland.

Mr. FARR. Did that go out beyond the 12-mile zone?

Mr. JORDAN. Yes, sir. This attempts to gather up and catalog all of the information that is available offshore Delaware and in the Delaware Bay, as a matter of fact. We are beginning the process and I am quite encouraged, in fact, that we can do it. My own research in the Delaware Bay and the immediate offshore area of 30 odd years ago, I think, was a useful start in this direction. So it is not new.

Mr. FARR. Thank you. Anyone else on the panel?

Mr. BANINO. Congressman, I would like to add that the situation would not be much different than what goes on onshore whereby various government agencies, such as the U.S. Geological Survey and the State Geological Surveys do broad-based mapping of geological surveys and present maps to the general public, and then a mining industry, somebody interested in a particular mineral resource, will take that as a starting point and then from there, based upon that knowledge, focus in on a particular area and expend its own funds to do extensive studies, extensive exploration of a particular area or a particular site.

I think the same situation would exist offshore. There is mapping going on at a number of different levels of the resources. And industry, if it is interested, if it sees the opportunity to develop those resources, would take that generally available information, analyze it, make some determination about where they might find the mineral resource of interest to them, and then expend their own funds in order to ascertain whether it is potentially economic.

Mr. FARR. Yes, sir.

Mr. PILKEY. I wonder if I could—I would like to add something here, and that is that we are much better prepared to do this on land than we are on the Continental Shelf where we have so many uses on the Continental Shelf that could conflict and there is no

land use planning. No zoning of the Continental Shelf. We do need something like that.

We just in North Carolina very recently had a situation where one agency was planning a marine sanctuary and another agency was planning a sewer outfall in the same location which obviously conflicted.

But your point is really an excellent one. And I think with beach replenishment, we need to look at all the sources. Right now we seem to be picking sources more or less by accident. In the southern United States and the Mid-Atlantic United States, there is a lot of land sand in some places that could be used and it might be that using some of these land sources for sand such as Virginia Beach is doing and Myrtle Beach has done would be better environmentally and economically than going out on the Continental Shelf.

Mr. FARR. Mr. Chairman, in closing, my observation and an interesting comment, a fact that I read that the world population is going to double by the year 2058, and that if the world population doubles, it will double where it now exists. Seventy-five percent of the population of the world lives on the coastal zone. So the coastal zone is going to double in our—well, a little over some of our lifetimes, certainly over my lifetime, but it seems to me that this is the time when we begin developing management strategies that balance out between these conflicting coastal zone issues.

In my area, the fishermen are battling with the different types of fishing, from dredging to long line, to trollers. They are all getting tangled up. And then out there you have mineral exploration mapping going on and some of that mapping tears up the crab pots and things like that.

We just created a battle to stop offshore oil drilling in the central coast of California, and it ended up being a Presidential reelection issue, and now we have the world's largest marine sanctuary trying to stop offshore oil drilling, and we have stopped it.

But what we learned in all of that is that our survival on the coast is dependent on those ecosystems that promote the tourism, promote the agriculture, and promote the quality of life and we have developed a lot of ability to manage the uses on land. But as soon as the technology allows us to get into the ocean, I think all of the abuses that we have created on land we will carry into the ocean unless we have the ability to think ahead.

And that is why I think your Committee here is really on to an issue on mineral management and ocean mineral management that is really important to the future, if indeed we are going to be able to manage a doubling of the world population in that coastal zone in the next 50 years or so.

I think that the responsibility here is tremendous and I thank you and the panelists for bringing it to light here and in Congress that we have some public policy responsibilities to deal with.

Mr. GREEN. Thank you, Congressman Farr, and I agree that management needs to be there because with that doubling of that population we also have to have not only the land that they can live on but the resources so they can produce and survive, whether it be for housing, for warmth, for air or for anything else, so I think you are right that we need to look at the master plan and look at it all together instead of let us look at it after 3 miles now or 12

miles now because we have technology or we happen to need it. But I agree with you.

If there are no other questions, that concludes the testimony for this hearing. And I want to thank this panel and the previous panel, too, for the valuable testimony and insights you have shared. The other members of the Subcommittee and Chairman Ortiz and Chairman Lehman may have additional questions for the witnesses and we appreciate a reply in writing and we will submit those to you.

Thank you again for being here and this hearing is adjourned.

[Whereupon, at 2:35 p.m., the Subcommittee was adjourned, and the following was submitted for the record:

83-315 O - 94 - 2

TESTIMONY OF CYNTHIA QUARTERMAN
DEPUTY DIRECTOR -- MINERALS MANAGEMENT SERVICE
DEPARTMENT OF THE INTERIOR

BEFORE THE
HOUSE MERCHANT MARINE AND FISHERIES SUBCOMMITTEE ON
OCEANOGRAPHY, GULF OF MEXICO AND THE OUTER CONTINENTAL SHELF
AND THE
HOUSE NATURAL RESOURCES SUBCOMMITTEE
ON ENERGY AND MINERAL RESOURCES

July 26, 1994

I am pleased to appear before the Chairmen and Members of both subcommittees today to testify on H.R. 3678 which would augment the authority of the Secretary of the Interior with respect to specific uses of Outer Continental Shelf (OCS) mineral resources.

As you know, the Secretary has delegated to the Minerals Management Service (MMS) the responsibility for managing all aspects of mineral development on the OCS under authority of the OCS Lands Act. Specific authority for conveying exploration and development rights for marine hard minerals, including sand, gravel, and shell resources is contained in Section 8(k). The MMS believes that it is essential that any new marine mineral activity, including use of sand from the OCS for coastal restoration projects, be carried out consistent with long-standing minerals management practices and principles developed to protect the public interest in development of its natural resources--including protection of the environment, safety of operations, protection of property rights, efficient recovery of mineral resources, and assurance of a fair return for use of valuable minerals. In these respects MMS has worked very hard to be a good neighbor by becoming a partner with nineteen States in addressing their mineral resource needs and development questions. In many cases these needs and questions have arisen from the serious problem of shoreline erosion facing many coastal States. Annual erosion rates as high as 20 meters have been observed, and severe storm damage can extract high tolls in any area in terms of beach and wetland loss, property damage, and even loss of life. MMS has given particular attention to the potential uses of OCS sand resources in response to this problem and a large proportion of State/MMS partnership arrangements deal with this area.

MMS has made a significant investment since 1991 to establish a base of environmental information and to identify and undertake additional studies needed to answer questions about possible effects of marine mineral development. MMS began in 1991 with a comprehensive worldwide literature survey of research pertaining to the environmental effects of marine mineral extraction. In 1992 a three-year study was initiated to look at the long term impact and recolonization capabilities of ocean bottom communities in areas of sand dredging. In 1993 MMS provided support for a four-year study to investigate impacts of shallow placer mineral recovery. Last year another important study began which is evaluating current marine mining procedures and technology to determine ways in which improvements can be

made to minimize or eliminate environmental disruption. Additional studies are planned for this year. One study would investigate the effects of sediment plumes generated by dredging operations. A second study would utilize ocean wave modelling programs and data to optimize the engineering and environmental integrity of a barrier island restoration project in Louisiana. This kind of information is considered integral to the decisionmaking process for marine mineral activities on the OCS.

We believe the negotiated agreements approach proposed in H.R. 3678 would facilitate this work and allow us to accomplish the mutual goals of the States and MMS. The subject bill expands the Secretary's authority for conveying rights to Federal OCS sand, gravel, and shell resources for, or in association with, certain types of public works projects. Under Section 8 (k) of the OCS Lands Act, the Secretary is limited to conveying the rights to such minerals through a competitive leasing process. The proposed expanded authority would be consistent with Department of the Interior (DOI) practice onshore where Federal sand and gravel resources can be conveyed under non-competitive "free use permits" to government organizations to support public works projects. Further, the new flexibility provided to negotiate agreements would not preclude the application of a competitive process for mineral conveyances to industry for private use of minerals--for example, leasing sand and gravel for building construction projects. The new authority for OCS sand and gravel would effectively address several problem areas that have emerged in applying a bidding process to certain public works situations:

First, the existing competitive bidding process cannot guarantee State or local governments the rights to an OCS sand resource unless they offer the highest bid and it is accepted. Neither can the Secretary control the end use or the ultimate cost of the resource to the State or local government should another bidder acquire the rights to the Federal sand resource. Consequently, such governments now face a fair degree of risk and uncertainty in relying on Federal OCS sand for their beach nourishment or other public works projects. The negotiated agreement approach to support governmental projects can eliminate this uncertainty.

Second, under existing authority, the DOI is unable to allow the U.S. Army Corps of Engineers (Corps) access to sand on the Federal OCS. The Corps is involved in many beach nourishment and coastal restoration projects nationwide including most of the 10 current State/MMS cooperative projects. While sand for the Corps projects has historically come from State waters, there is increasing interest in Federal OCS sand because nearshore resources are diminishing or may be physically unsuitable or environmentally unacceptable for use. The new authority to negotiate agreements for use of Federal sand will assist in resolving issues concerning the Corps' beneficial use of sand dredged from navigation channels in Federal waters and the Corps' access to Federal deposits of sand and gravel for use in coastal restoration projects. The MMS has met with officials from the Department of the Army regarding this access issue and both parties acknowledge the potential of H.R. 3678 for resolving this issue.

Third, the MMS has instituted 10 separate cooperative arrangements with 16 coastal States to study the feasibility of using OCS sand and gravel. For eight of these projects, the primary interest is the identification and assessment of OCS sand for coastal restoration needs. The expanded authority of H.R. 3678 would offer the appreciable advantage of conserving costs by focusing environmental and associated studies on only the specific, limited extraction scenarios necessary to evaluate public works projects. Under typical competitive leasing requirements, more costly studies would likely be required to capture the broader range of possible commercial end uses and wider geographic area.

The MMS also supports the provision for charging a fee, when appropriate, for using OCS sand, gravel, and shell resources. The Secretary can determine a suitable fee based on the market value of the resource, project economics, and the public interest served. In cases where the OCS resources are used for (or from) a Federal project (for example, Corps shore protection or navigation project), it would seem reasonable to forego charging a fee for the resource. The legislated Federal cost share for Corps projects typically ranges from 50-100%, depending on the type of project and the ownership of the shore. The total costs for Corps projects include sand transportation and placement costs, and typically include any costs for the sand. Normally, no costs have been assessed for sand resources in State waters.

The MMS recognizes that beach nourishment, coastal restoration, wetlands creation, and beneficial uses of sand from navigation channel construction and maintenance all serve important public interests. These interests coupled with the potential role of OCS sand resources are largely responsible for the significant growth in MMS cooperative agreements with coastal States over the past few years. H.R. 3678 would definitely facilitate the objectives of these efforts and further solidify State/Federal relationships. It is also likely that the negotiated agreement option will intensify State and local government interest and consequently increase the number of State/MMS projects. While the MMS supports this bill, we remain open to working with the Committees, the Department of the Army and other interests on the final form of the legislation.

This concludes my prepared testimony. I will be pleased to answer any questions which the Chairmen and other Members may have.

State of Delaware
DELAWARE GEOLOGICAL SURVEY
UNIVERSITY OF DELAWARE
Newark, Delaware
19716-7501

ROBERT R. JORDAN, STATE GEOLOGIST
DELAWARE GEOLOGICAL SURVEY BUILDING
PHONE: 302-831-2833
FAX: 302-831-3579

Testimony

of

Robert R. Jordan

before

U. S. House of Representatives, Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf and Subcommittee on Energy and Mineral Resources

Washington, D. C.

July 26, 1994

Introduction

Good afternoon Mr. Chairman, Members of the Subcommittees, Ladies and Gentlemen.

I am Robert R. Jordan, State Geologist of Delaware, Director of the Delaware Geological Survey, and Professor of Geology at the University of Delaware. I appreciate this opportunity to offer some comments on the technical aspects of coastal geology in support of H. R. 3678 and the general objective of appropriately facilitating access to sand resources that might be used constructively for beach nourishment.

Beach Processes

Along much of the coastline of the United States, and certainly in my State of Delaware, sandy shores are intensely used and are major economic assets. They are also, in geologic terms, delicate, active features that adjust to the forces of tides, waves, and wind. A state of dynamic equilibrium exists at a beach that dictates its shape, composition, and movement.

A relative rise of sea level upon the land is a powerful, overriding force acting on Delaware's beaches and many others. The response of sandy coasts to the sum of such force is migration in a landward direction, that is, what we perceive as erosion.

The relative rise of sea level along the Delaware coast, as many others, has continued for the past 12,000 years. It may be confidently predicted that the process will continue. The relative rise in Delaware is about a foot in a century, which means migration, or "erosion" of about a hundred yards a century.

Reactions

Fundamentally there are only three classes of reactions to significant landward shoreline migration:

1. Retreat - a reasonable geologic recommendation in the face of overwhelming natural force, but not always acceptable for economic and social reasons.

2. Structures -"hardening" of the coast, by structures such as seawalls, affords some protection but is generally detrimental to beaches carries high maintenance costs.

3. Nourishment - artificially supplying sacrificial sand to compensate for that moved and removed by coastal processes.

At various times and places we have utilized all three types of actions. Nourishment is the preferred action in some of our areas, and in many places beyond Delaware. Sand is dredged from offshore, pumped to the beach, and shaped to imitate natural conditions. Large quantities of sand are required and it should be of the proper texture and composition to be compatible with the forces acting on a particular beach.

Resources and Problems

In my experience we have taken sand for beach nourishment from mines on land, from lagoons behind the beaches, from the flood tide delta of an inlet, and from shoals offshore in State waters. Sources of sand of appropriate quantity and quality are being depleted and there are competing land uses, not just in Delaware, but on many coasts.

Thus the search for nourishment resources must extend farther seaward. An artificial barrier exists, though, in the form of the boundary between State and Federal jurisdictions three miles offshore (with a few exceptions in the Gulf of Mexico). As Chairman of the Delaware State Boundary Commission for more than 20 years, I am acutely aware of issues at this interface.

The situation in Delaware is not unusual. During my recent term as Chairman of the Outer Continental Shelf Policy Committee of the Department of the Interior we approved and sent to the Secretary a report, "U. S. Outer Continental Shelf Sand and Gravel Resources," documenting the demand and availability of such resources. Particularly pertinent findings are:

* Offshore sand is presently being used for beach nourishment, and the demand will increase significantly in the near term.

* Offshore supplies of beach nourishment sand and aggregate are sufficient to meet specific market demands and could provide resources environmentally preferable to onshore alternatives.

* [Concerned parties] should work together in the development of new legislation that will provide a workable policy and appropriate procedures for managing offshore hard minerals development.

We have sufficient scientific understanding of beach processes and the distribution of sand resources to demonstrate that access to the Federal OCS is desirable for shoreline restoration and protection. The technical studies that support such conclusions have in part been supported by the Minerals Management Service, which was commendably farsighted in stimulating State investigations of processes and resources. Ironically, that support now appears to be a casualty of shortsighted budget reductions. Science should instead be encouraged to keep pace with the opportunities that good legislation may provide.

Conclusion

A very real need exists and it is desirable to provide the administrative mechanism to address it. The bill before you would permit a reasonable option for dealing with the sensitive, critical areas that are our sandy coasts.

Thank you for your interest. I will be pleased to respond to questions and welcome any opportunity to document or expand these comments.

AASG

ASSOCIATION OF AMERICAN STATE GEOLOGISTS

PRESIDENT *
Donald M. Hoskins
Bureau of Topographic
and Geologic Survey
P.O. Box 8453
Harrisburg, PA 17105-8453
Phone: 717-787-2169
FAX: 717-783-7267

PAST-PRESIDENT *
Donald A. Hull
Oregon Dept. of Geology
and Mineral Industries
Suite 965
800 NE Oregon Street #28
Portland, OR 97232-2162
Phone: 503-731-4600
FAX: 503-731-4066

PRESIDENT-ELECT *
Walter Schmidt
Florida Geological Survey
Gunter Building
903 W. Tennessee Street
Tallahassee, FL 32304-7700
Phone: 904-488-4191
FAX: 904-488-8086

VICE-PRESIDENT *
Norman C. Hester
Indiana Geological Survey
611 N. Walnut Grove
Bloomington, IN 47405
Phone: 812-855-9350
FAX: 812-855-2862

SECRETARY-TREASURER *
Earl H. Bennett
Idaho Geological Survey
Room 332, Morrill Hall
University of Idaho
Moscow, ID 83844-3014
Phone: 208-885-7991
FAX: 208-885-5826

*EXECUTIVE COMMITTEE
MEMBERS

STATISTICIAN
Haig F. Kasabach
New Jersey Geological Survey
P.O. Box CN-029
Trenton, NJ 08625
Phone: 609-292-1185
FAX: 609-633-1004

EDITOR
Thomas M. Berg
Ohio Geological Survey
4383 Fountain Square Drive
Building B
Columbus, OH 43224
Phone: 614-265-6576
FAX: 614-447-1918

HISTORIAN
Donald L. Koch
Iowa Geological Survey
123 N. Capitol Street
Iowa City, IA 52242
Phone: 319-335-1575
FAX: 319-335-2754

POSITION STATEMENT

The Association of American State Geologists, and specifically its coastal state members, supports H. R. 3678, introduced by Congressman Ortiz and currently being considered by the Merchant Marine and Fisheries Subcommittee on Oceanography and the Natural Resources Subcommittee on Energy and Mineral Resources.

H. R. 3678 authorizes the Secretary of Interior to negotiate agreements for the use of OCS sand, gravel and shell, in lieu of competitive bidding currently required under OCSLA.

This bill, if enacted, would support coastal restoration activities and would allow public-works projects, involving state and local governments, the ability to gain access through a negotiated mechanism. The current bidding requirement is a constraint to the use of OCS sediment resources for beach nourishment and coastal wetland creation.

The Association judges that passage of this bill would positively serve the needs of the coastal states in addressing shoreline erosion problems. It could help in identifying and securing source material for beach restoration projects and constrain costs by maximizing the use of federal, state and local government resources.

We urge enactment of the H. R. 3678.

William L. Fisher, Texas, Chairman
AASG Committee on Resources and Environment of the Continental Margins
on behalf of its members:
James F. Davis, California; Charles H. Gardner, North Carolina; Stanley Johnson, Virginia; Robert R. Jordan, Delaware; S. Craigin Knox, Mississippi; Ernest A. Mancini, Alabama; William McLemore, Georgia

and

Donald A. Hull, Oregon, Chairman
AASG Committee on Coastal Erosion
on behalf of its members
Thomas M. Berg, Ohio; Emery T. Cleaves, Maryland; William L. Fisher, Texas; Charles H. Gardner, North Carolina; Richard Hyde, Connecticut; S. Craigin Knox, Mississippi, William E. Marsalis, Louisiana; Manabu Tagamori, Hawaii

TESTIMONY OF JAMES V. CHISHOLM

As City Manager of the Town of South Padre Island, Texas, a resort community with a resort population of 25,000, I recognize the dynamics ana ever changing characteristics of the Texas Gulf Coast. One of our best known experts Dr. Robert Morton of the University of Texas-Austin, has devoted significant resources in studying the Coast of Texas. The conclusion reached by Dr. Morton and his colleagues is contained in a report dated, August, 1993, entitled "Shore Line Movement Along Developed Beaches of the Texas Gulf Coast". Dr. Morton stated in his report the beaches of South Padre Island generally have eroded continuously, since the late 1800's.

The Town of South Padre Island recognizes beach nourishment is a solution for those areas experiencing excessive erosion. To this end, beach quality material and its availability is crucial to maintaining our quality of life and storm protection for the community.

We are currently included as a part of Section 933, Project For Beach Nourishment through the U.S. Army Corp. of Engineers. H.R. 3678 would allow local units of government in conjunction with federal agencies the opportunity to utilize federally controlled resources which could aid in the restoration or protection of Gulf Coast communities. In my opinion, the single most effective asset in minimizing storm surge damage is a beach and dune system. Our community is committed to restoring a system of dunes and enhancing our beaches. An off-shore sand resource may prove to be the most feasible opportunity for our community to replenish our beach. The attached mapping demonstrates the severity of coastal erosion in our community which is somewhat a representation of coastal conditions along the Texas Gulf Coast. I recommend your favorable consideration of H.R. 3678.

SHORELINE MOVEMENT ALONG DEVELOPED BEACHES OF THE TEXAS GULF COAST: A USERS' GUIDE TO ANALYZING AND PREDICTING SHORELINE CHANGES

HIGH ISLAND TO SARGENT BEACH

(Jefferson, Chambers, Galveston, Brazoria, and Matagorda Counties)

MUSTANG AND NORTH PADRE ISLANDS

PORT ARANSAS TO PADRE BALLI PARK

(Nueces County)

SOUTH PADRE ISLAND

MANSFIELD CHANNEL TO BRAZOS SANTIAGO PASS

(Willacy and Cameron Counties)

Robert A. Morton assisted by Cynthia Jennings and Lisa Remington

Open-File Report 93-1
Bureau of Economic Geology
W. L. Fisher, Director
The University of Texas at Austin
Austin, Texas 78713-7508

August 1993

SUMMARIES OF SHORELINE MOVEMENT, TEXAS GULF COAST

Methods

Historical shoreline changes presented in this report were derived from shorelines compiled on topographic base maps. The shorelines were then digitized and entered into ARC/INFO, the geographic information system used by the Bureau of Economic Geology. To determine shoreline movement at specific sites, shore-normal transects were constructed on the topographic base maps at intervals equal to 5,000 ft along the coast. In appendices A, B, and C, the transects are identified by letters and numbers that indicate the shoreline segment and transect number within that segment. The letters are

abbreviations for common geographic features that are familiar to coastal residents and government officials. The geographic abbreviations are listed in the captions for each appendix.

In this report, tables and graphs are used to summarize shoreline movement along the developec Gulf beaches and barrier islands of Texas (appendices A, B, and C). These tables and graphs are keyed t transect numbers that appear in all previous reports of Gulf shoreline changes published by the Bureau of Economic Geology. The transect numbers also are illustrated on the beach stability maps on file wit the Texas General Land Office. At each transect, distances between successive shorelines were measure and rates of change were calculated on the basis of the magnitude of change for a specific period. Typical time periods used to calculate rates of change are as follows: mid to late 1800's to early 1930's, early 1930's to mid 1950's, mid 1950' to 1965–1970, 1965–1970 to 1974–1975, 1974–1975 to 1982, anc 1982–1990 (appendices A, B, and C).

The rates of change used to characterize shoreline stability at each transect were calculated from the long-term trends, as illustrated in appendices A, B, and C. The period over which the rate of change was averaged was determined by the shape of the shoreline movement curve at each transect and specific knowledge regarding coastal processes and human modifications to the littoral system. This procedure eliminated older periods when the rate or trend of movement was significantly different and focused on the most recent periods of shoreline movement that will probably continue into the forseeable future unless there is a major change in sand supply to the beach. Most of the average rates of erosion incorporated at least 60 years of data and none are based on less than 20 years of data based on aerial photographs and beach profiles.

A few graphs depicting shoreline movement (appendices A, B, and C) contain brief notations that pertain to segments of the curve or inflection points where the curve shape changes abruptly. The notations briefly explain the changes in the trend of beach movement (erosion or accretion) or in the rate of movement (faster or slower) compared to earlier time periods. More detailed explanations of the changes in shoreline movement are commonly contained in the original reports (Morton, 1974, 1975; Morton and Pieper, 1975a, 1975b, 1976, 1977a, 1977b; Morton and others, 1976; Paine and Morton, 1989).

Beach stability data are not presented for remote and sparsely developed segements of the coast such as between Sabine Pass and High Island, east and west Matagorda Peninsula, Matagorda Island, San Jose Island, and Padre Island National Seashore (north and central Padre Island). Summaries of shoreline movement for these and other undeveloped coastal segments are available in the original Bureau reports (Morton and Pieper, 1975; Morton and others, 1976; Morton and Pieper, 1977; Paine and Morton, 1989).

High Island to Bolivar Peninsula

Since the late 1800's, most of the Gulf shoreline between High Island and Bolivar Peninsula has undergone cycles of erosion and accretion or stability. The predominant trends have been erosion from the 1800's to the 1930's, accretion from the 1930's to the 1950's, erosion from the 1950's to 1974, and accretion or stability since 1974. Some of the beach accretion or stability since 1974 may be the result of low water levels in February 1990 when the aerial photographs were taken. However, beach profiles surveyed between 1984 and 1992 at High Island and at Caplen on Bolivar Peninsula confirm the accretion or beach stability that was documented by comparing the shoreline positions mapped on aerial photographs.

Although the long-term trend reversals occur approximately every 30 years, the cycles are impossible to predict accurately, therefore the entire time period (1800's to 1990) was used to calculate the average rate of change at most transects. According to the 1990 shoreline position, the beach has experienced net erosion at transects 32–50, whereas the beach has experienced net accretion at transects 51–62 (appendix A).

Galveston Island

After the jetties were constructed at the east end of Galveston Island, East Beach began accreting rapidly because sand was trapped between the south jetty and the seawall. The accretion continued until the 1950's, when the shoreline position stabilized (appendix A). Since then, East Beach has undergone minor erosion, but the net change since the mid 1800's is still accretion. All the other beach segments of Galveston Island have experienced net erosion between the mid 1800's and 1990. The greatest net erosion and the largest fluctuations in shoreline position on Galveston Island have occurred at the southwestern end of the island near San Luis Pass.

At many transect sites on West Beach, erosion began or accelerated after 1956. Beach profiles surveyed by the Bureau of Economic Geology since Hurricane Alicia in 1983 show that the highest sustained erosion rates on Galveston Island are southwest of the seawall. Shoreline movement since 1983 recorded by the beach profiles confirm the trends of beach erosion determined from the aerial photographs.

Graphs illustrating shoreline movement at transects along the Galveston seawall are not presented in appendix A, and recent rates of shoreline movement were not calculated for those transects because there is no sand beach at some sites and the limited sand beach at other sites is controlled by the seawall and rock groins. A preliminary analysis of beach erosion at the Galveston seawall showed that erosion increased as the seawall interacted with the waves and currents, but then erosion rates

decreased as the sand supply in front of the seawall was depleted (Morton, 1988). Beach profiles surveyed by the Galveston District Corps of Engineers are the best available data for an analysis of shoreline movement along the seawall before and during the period when the sand supply was being depleted.

San Luis Pass to Sargent Beach

Plots of shoreline movement along Follets Island (transects 1–12) show net erosion dominated by erosion between the mid 1800's and 1974. Since 1974 the beach has accreted, probably as a result of sand transferred down the island by Hurricane Alicia. Some of the beach accretion or stability since 1974 may be the result of low water levels in January 1990 when the aerial photographs were taken. However, beach profiles surveyed between 1984 and 1992 on Follets Island confirm the accretion or beach stability that was documented by comparing the shoreline positions mapped on aerial photographs.

The large and complicated changes in shoreline position recorded at transects 13–28 are related to changes in sediment supply associated with engineering projects. The projects included construction of the jetties at Freeport Harbor and diversion of the Brazos River mouth. More recent changes between transects 25 and 28 are related to the southwestward migration of the new Brazos delta caused by the longshore transport of sand. The beach has undergone net accretion from transect 13 to transect 26, but the most recent trend of shoreline movement has been erosion between transects 15 and 24. The change from accretion to erosion is related to the reduction in sediment supply and reworking of the beach sediments by waves. Morton and Pieper (1975b) presented the history of shoreline changes caused by human alterations of the Brazos River.

From transect 27 to transect 42 the beach has undergone net erosion. In fact the beach has eroded systematically at all transect sites except at 27–29 where the most recent trend is beach accretion. The trend reversal from erosion to accretion at these three sites is caused by the southwestward transport of sand from the new Brazos delta. At most of the other sites, beach erosion increased rapidly after the Brazos River was diverted. Beach profiles surveyed at Sargent Beach by the Galveston District Corps of Engineers confirm the beach erosion that was documented by comparing the shoreline positions mapped on aerial photographs.

Mustang and North Padre Islands (Port Aransas to Padre Balli Park)

The beaches of Mustang and North Padre Island generally have undergone net erosion since the late 1800's (appendix B). Even where net accretion has occurred, the most recent trend is erosion. A consistent pattern of shoreline movement between transects 9 and 19 is as follows: erosion from the

late 1800's to 1937, accretion from 1937 to the late 1950's, and erosion from the late 1950's to 1982. Recent erosion on North Padre Island near the seawall (transect 20) and at Padre Balli Park (transect 22) are confirmed by beach profiles surveyed by the Bureau of Economic Geology (Morton, 1988) and by the removal of the bathhouse at the park that was abandoned because of beach erosion.

The beach on Mustang Island has undergone net accretion at transects 1–4 (appendix B) related to southward migration of Aransas Pass in the late 1800's and impoundment of sand by the south jetty at Aransas Pass. The anomalous net accretion at point 21 on North Padre Island was caused by closing of Packery Channel and advancement of the shoreline until it reached a position that was in line with the beach on either side of the former inlet. The beach at transect 21 did not accrete beyond the normal trend of the shoreline. The beach at this site has been eroding since about 1970.

South Padre Island (Mansfield Channel to Brazos Santiago Pass)

The beaches of South Padre Island generally have eroded continuously since the late 1800's (appendix C). Highest sustained erosion has occurred between transects 10 and 13, where the shoreline orientation changes and wave energy is focused on the protrusion of land. At many of the transect sites, the average rate of erosion is greater than 10 ft/yr.

Exceptions to the trend of systematic erosion occur where the littoral drift system has been disrupted by jetties at deep-draft navigation channels. The shoreline change profile at transect 3 (appendix C) shows continuous erosion until 1960 and then accretion after 1960 when the jetty was built at Mansfield Channel. The beach at this site is accreting because sand transported northward by longshore currents is trapped on the south side of the jetty. Similarly, beaches on the southern end of South Padre Island (transects 19–21) have been either stable or accreting since 1935 as a result of sand trapped by the north jetty at Brazos Santiago Pass.

ACKNOWLEDGMENTS

This work was funded in part by the U.S. Geological Survey Coastal Geology Program under cooperative agreement 14-08-0001-A0912. Additional funding was provided by the Galveston District Corps of Engineers, Matagorda County Commissioners Court, the Texas General Land Office, and the Town of South Padre Island. We thank all these supporters who made it possible to conduct the study. The report was edited by Amanda Masterson and designed by Margaret Evans. Final manuscript processing was by Susan Lloyd.

Testimony of Orrin H. Pilkey, Jr., before the Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf of the House Merchant Marine and Fisheries Committee, and the Subcommittee on Energy and Mineral Resources of the House Natural Resources Committee, regarding Outer Continental Shelf Sand, Gravel, and Shell Resources,
July 26, 1994

Statement written by Orrin H. Pilkey, Jr. and David M. Bush. Dr. Pilkey is James B. Duke Professor of Geology, Duke University, and Director of the Duke University Program for the Study of Developed Shorelines. Dr. Bush is a Research Associate at the Duke University Program for the Study of Developed Shorelines.

Orrin H. Pilkey, Jr.
Duke University Department of Geology
Program for the Study of Developed Shorelines
Campus Box 90228
Durham, North Carolina 27708
(919) 684-4238

CONCLUSIONS

Offshore sand and gravel is a finite and sometimes hard to find resource that is spotty in its distribution off our coasts. Extraction of this resource is potentially very damaging environmentally. A large volume of dredged shelf sand, containing a very small percentage of mud, can cause serious biological problems because all the mud is released at once. The damage is especially serious for fixed fauna and flora attached to hardgrounds or reefs. In this sense, the shelf on both sides of the Florida peninsula is particularly susceptible to environmental damage. Smothering of bottom fauna and flora may occur miles from the actual site of dredging. A longer-term problem is created by mud accumulation in dredge-created depressions. Storms can resuspend this material causing detrimental biological impacts decades after dredging has ceased. Complicating the problem of understanding the impact of Outer Continental Shelf dredging is the fact that current mathematical models used to predict such impacts are over-simplified and hopelessly outdated. Much remains to be learned about physical processes (especially storm processes) on the inner shelf where most of the anticipated dredging will occur.

The environmental impacts of dredging may be hidden from previous monitoring studies which have recognized neither the long-distance and long-term nature of biological effects, nor the event-related (storms) nature of mud dispersal. Our current weaknesses in understanding the potential environmental impacts of mining must be rectified with a new approach to monitoring by simultaneously taking into account the event-related, long-distance, and long-term nature of the problem.

INTRODUCTION

Obtaining sand from the coastal zone for any purpose entails environmental damage. Regardless of whether the sand is obtained from inland dunes, modern coastal dunes, or from offshore, there will be a loss to existing natural ecosystems. It is difficult to measure relative environmental damage, but perhaps mining of modern coastal dunes and beaches, still a widespread practice in much of the world, and by "midnight supply" along much of the U.S. coast, is the most damaging to humans and the environment. Taking away coastal shoreline sand reduces storm protection and has led to increased storm damage to development and infrastructure in numerous instances.

Mining of inland sand for beach replenishment or other purposes as at Virginia Beach, VA or Myrtle Beach, SC, is perhaps the least damaging approach. At least on land, the ecosystem damage can be restricted more or less to the actual site of mining. Continental shelf mining may impact on areas miles away from the actual site of mining. Mining from the continental shelf is becoming more and more attractive, however, as land sources are increasingly locked up by the intensive development of our coastal zones.

Offshore sand of "appropriate" quality is difficult to find and requires careful prospecting. Some areas (for example, much of Onslow Bay, NC, and the Gulf of Mexico coast of Florida) may not have sufficient offshore supplies of sand to make any difference in the replenishment picture. In other areas, sand supplies found by seismic reflection studies may be of too poor quality to be of use. In one instance on the northern Puerto Rico shelf, the U.S. Army Corps of Engineers determined on the basis of a few cores and seismic evidence that a large offshore body of sand existed, suitable for beach replenishment. But a much larger suite of cores obtained by the U.S. Geological Survey indicated that the deposit contained a large mud content, rendering the sand useless or marginal at best.

The continental shelf is not simply covered by a blanket of sand, the picture that has long been painted. Along the sand-poor U.S. mid- and south-Atlantic coasts, sand deposits will likely be found in restricted sites such as submerged tidal deltas, inlet channels, and river channels left behind by the rising sea level. Development of such sand sources will require seismic and side scan sonar studies followed by detailed coring studies.

It seems that the basic pressure behind the drive to mine sand, gravel, and shell material from beyond the three mile limit is to find a source of replenishment sand. If the highest bidder process is followed, as is the case for hydrocarbon production, local communities would end up paying the highest prices for already costly replenished beaches.

Finally, it is important to note that offshore sand is a finite resource. It should be husbanded carefully and for societally important purposes. Exploiting this resource should be done with an eye to the long-range future supply of sand.

POSITIVE ASPECTS OF MINING ON OUR INNER CONTINENTAL SHELVES BEYOND THE THREE-MILE LIMIT

Offshore sand, gravel, and shell mining will take some pressure off valuable and fragile beach and dune systems as sources. Major damage has been done to the shores and beaches of the U.S. by mining of dunes, beaches, and rivers. Dune sand mining has impaired the ability of the dunes to protect the coast from storms and erosion. River mouth sand mining is common in many places. The sand taken from the river mouths, however, was on its way to the beach and dune system, so this really must be considered as part of the same system.

Mining well offshore will reduce the potential for erosion caused by wave refraction. The Dutch regulate offshore mining of large volumes of sand for beach replenishment purposes to a minimum of 12 miles offshore, specifically to avoid wave refraction changes. In the United Kingdom, dredging in the offshore is limited to depths greater than 60 feet, based on their observations that beyond 45 feet water depth there is very little or no sediment transport toward beaches. Fifteen feet additional water depth was added as an extra precaution.

Current practices of the U.S. Army Corps of Engineers is to mine sand very close to shore, often from tidal deltas and inlets. Nearshore mining not only creates wave refraction problems, but also may cause sand supply deficits in a longer-term sense. For example, reducing the size of an ebb tidal delta may well reduce the volume of sand transport between barrier islands. In part, nearshore mining is necessitated by cost considerations, but the availability of offshore sand in some locations could change the cost picture.

PROBLEMS CREATED BY OFFSHORE MINING OF SAND, AND GRAVEL

Possible Environmental Problems Related to Dredging Will Vary From Place to Place

Each shelf and nearshore system is different. Each inner continental shelf has its own array of processes. Impacts of shelf mining will also vary accordingly. It is difficult or impossible to apply information from one coast to another coast (Windom, 1976).

There are differences in wave energy, orientation of shoreline, storm type and frequency, storm approach direction, flora, fauna, grain size of sediments, mud content, etc. Thus, techniques of environmentally sensitive mining of the continental shelf must vary widely from place to place. Monitoring of the impacts of mining should also be tailored for specific locations.

Along the Mid-Atlantic coast and to the south, sand removed from the offshore will not be naturally replenished. These are very low sand volume areas, there is little sand moving in the system. Along most of the U.S. East Coast, very little new sand is supplied to

the shelf via rivers. Most rivers deposit their sediment load at the head of estuaries such as Chesapeake Bay or Pamlico Sound. Onslow Bay, NC, for example, has only a very thin and patchily distributed veneer of sediment over and between rock outcrops on the continental shelf. In the western Gulf of Mexico and along the U.S. Pacific coast, rivers do renew shelf sand but the volume of new sediment introduced has been reduced by sediment trapping at dams.

It is well established that sediment moves onshore from the shelf to the beaches during fairweather (storms often move sand in an offshore direction). The distance offshore from which onshore transportation of sediment occurs, however, is generally unknown and probably varies widely from place to place. Depressions formed by dredging in the offshore will act like a dam, a sink of sediment, some of which may be on its way to the beach. To the extent possible, it must be clearly understood where the natural sand is coming from on each shoreline so mining will not interfere with this supply.

Dredging and Replenishment Operations Create Mud in the Short Term; Shelf Depressions Caused by Dredging Will Create Mud in the Long Term

Mud released to the nearshore system, produced as dredging is occurring or as sand is being emplaced on nearby beaches, is a short-term hazard. The problem with the dispersal of mud accumulating in a dredging-formed depression is that it may be released only during major storms of a 10-year or even higher recurrence interval. Thus, it is a long-term effect. Such mud, as happens sometimes after river floods, tends to be temporarily deposited on the seafloor nearshore zone, after the storm subsides, to be eventually moved offshore to the continental slope over ensuing days, months, and years. It is this brief period of nearshore residence of the mud which is most damaging.

A minor storm occurred during one of the replenishment dredging operations off Boca Raton, FL. Immediately after the storm subsided, mud covered portions of the inner shelf, especially near the jetty at Lake Worth Inlet, off Palm Beach, FL, some 25-30 miles away. Local divers reported that such a mud cover had never occurred before. Virtually the only possible source of a this widespread muddy sediment was the Boca Raton dredging project. Worm reefs and coral heads were devastated. The mud off Palm Beach disappeared within a few days, but left behind great localized damage to filter-feeding organisms which can tolerate only the very shortest of muddy episodes. The impacts here were rapid and a long distance from the operation. Removal of the mud from off Palm Beach was also very rapid.

U.S. Army Corps of Engineers statements that concerns about water quality degradation during dredging operations are unfounded (Office of Technology Assessment report: Marine Minerals: Exploring our New Ocean Frontier) may be a simple reflection of the fact that whatever happens, it happens so quickly that monitoring has not detected it.

We know that natural depressions on shelves are often sinks for relatively fine-grained sediment and mud. Depressions form a shelter from wave activity. This has been observed

even on the very high wave energy northern shelf of Puerto Rico in an area of very clean, mudless sand. Depressions made by dredging would likewise become sinks for mud, waiting to resuspended by a forthcoming storm. Evidence that this can create problems, however, is purely anecdotal to date.

Off the south shore of Long Island, NY, a ditch across the nearshore zone for a sewer outfall was abandoned and the ditch left unfilled. Several years later, a big storm caused muddier water than had ever been experienced in the area. It was suggested by Professor Donald Swift of Old Dominion University that the sewer line ditch had filled with fine-grained sediment which was resuspended by the storm. No studies have been made to document this, and in fact, it is exactly this kind of impact that is very difficult to document.

Effect on Waves of Creating a Depression on the Seafloor by Dredging

Depressions left by offshore mining can cause wave refraction and decreased attenuation of wave energy, leading to impacts on nearby shorelines. These usually cannot be predicted with any degree of accuracy. Off Grand Isle, Louisiana, a depression created by dredging caused wave refraction which concentrated wave energy on short reaches of adjacent beaches which in turn increased erosion rates on the replenished beach. In this case, the sand was taken from only one-half mile offshore.

Waves lose energy as their lowermost wave orbitals interact with the unconsolidated sea floor sediment cover. This is why sea floor rock outcrops with their lack of sediment cover are believed to directly cause shoreline erosion. Studies on the Gold Coast of Australia have shown close correlations between the occurrence of rock outcrops in the offshore and high erosion rates of replenished beaches. Similarly, depressions caused by dredging should also reduce wave energy attenuation and probably cause erosion. The effect of shelf depressions on this phenomenon has not been studied.

We Cannot Predict Accurately the Impact of Shelf Depressions on Shorelines

Computer models will not predict the impact of dredging changes on the sea floor on wave refraction and shoreline erosion. Belief in the validity of computer models to predict shoreline change is widespread in the coastal engineering community. The State of New York application for sand mining suggests that more sophisticated computer models should be run in order to predict changes. Also, on page 224 of Exploring our New Frontiers the call is made for detailed modeling of dredging effects, but this is probably a useless exercise. There is no single instance, of which we are aware, where successful predictions of wave refraction changes have been made. This simply cannot be done, for the following reasons.

1. We never know the wave climate for a given coastal reach with sufficient accuracy. In addition, "unusual or unexpected storms" are always coming by, producing conditions that weren't considered in the models.

2. Even if we could predict changes in wave patterns caused by dredging, we don't know what waves characteristics actually effect shoreline erosion. We use parameters such as the highest 1/10 or highest 1/3 of the wave height to describe storm surf zones, but these aren't close to describing reality.

3. There are constant natural changes in the shape of the nearshore, for example, offshore bar formation, and these cannot be taken into account. Such changes impact significantly on the nature of the waves coming ashore which are already impacted on by the bathymetric changes made by dredging.

Possible Effects on Fauna and Flora

Nearshore organisms are relatively adaptable to changes such as being covered by sediment than their offshore, deeper water counterparts which are adapted to a relatively more stable environment. But fixed organisms such as those on hard bottoms or seagrass beds or coral reefs, no matter what the water depth or distance from shore, have little tolerance for burial.

Flora and Fauna on Rocky Sea Bottoms

The southern Florida shelf, and other low latitude areas such as Puerto Rico, are of particular environmental sensitivity. Dredging in southern Florida for the 1979-1981 Miami Beach replenishment project is believed to have caused immense damage to offshore coral heads. This was not carefully documented, but according to reports of the City of Miami Beach, the offshore damage caused by siltation continues to the present. Off Boca Raton, anchor dragging by a dredge is said to have caused serious destruction along 300 yards of an offshore coral zone. Hardgrounds and their accompanying fixed fauna and flora exist to some extent on most American shelves, but they are particularly important off Florida. Their presence will be a strongly limiting factor for offshore mining along both sides of the Florida peninsula. Probably when past dredging damage is carefully documented here, there will be strong pressures from the environmental community to halt shelf dredging all together.

Flora and Fauna on Unconsolidated Sediment Bottoms

The fauna and flora of unconsolidated sediment bottoms often can move away from some of the damaging impacts of sand removal. But the impact of water muddied by an increase in suspended material both before and after dredging and the introduction of fines to the sea floor can still be very damaging. It is a poorly understood problem.

Officials of the City of Virginia Beach, VA have argued that modifying of offshore topography off the Sandbridge section, in a proposed dredging program for beach replenishment, will increase biodiversity by creating habitats on a previously flat sea floor.

This may be true, but the impact of introducing new species to an area should be well understood before doing so. It is hard to improve on nature!

We Really Don't Know How the Shelf Beyond the Three-Mile Limit Works

Offshore, nearshore, or inner shelf processes are poorly known, making the long-term impact of mining difficult to judge. Yet it is very important to understand the impacts before we begin to mine on a large national scale.

Most mathematical models, which are the usual basis of predicting impacts of dredging-related operations, are out of touch with our current understanding of the shelf. Such models, without exception, do not take into account storm-driven bottom currents, assume the absence of rock outcrops on the shoreface and shelf, and do not take into account the chaotic and probabilistic nature of nearshore processes (Pilkey et al., 1993).

All models assume the presence of a closure depth (usually at 10 meters water depth or less) beyond which there is little significant exchange of sediment in either the landward or seaward direction. This concept is often the basis for choosing dredging locations on the assumption that below closure depth, there will be less impact on the beach sediment supply. But studies by Gayes (1991), Pearson and Riggs (1981), Aubrey et al. (1982), and Wright, et al. (1991) all indicate that much sediment movement may occur across this imaginary line.

We are especially hard pressed to understand how storms work and it is probable that most sediment movement (seaward of the surf zone) occurs during storms. We have some understanding of storm processes on a theoretical basis (Swift et al., 1985) but few *in situ* measurements on the inner shelf of actual storm processes such as those obtained by Wright et al. (1991; 1994) and Madsen, et al. (1993).

The Need for Studies

Congress certainly must grow tired of hearing that more studies are needed before implementation of this or that project or procedure, etc. But the fact is that the possible impact of offshore dredging is very poorly known. The proper types of studies have not been carried out to date. Both short-term and long-term studies of impacts are needed. Short-term studies of the effect of dredging and replenishment need to be carried out at the time that operations are ongoing. This might detect impacts such as the anecdotally documented Palm Beach, FL mud sedimentation disaster. Problems with longer-range impacts of mud release must be studied in a much longer time frame in order to determine the importance of longer-term release of mud, as in the case of the Long Island mud release from a mid-shelf depression (also anecdotally documented). Most monitoring studies to date have been intermediate term (2-3 years) and do not begin until after dredging operations cease. They have also been carried out in an inflexible manner incapable of carefully documenting the

impact of storms. Future studies must be very flexible in order to monitor "events" and must be sufficiently long term to see real biological impacts (Grober, 1992).

The point is that at present, the lack of hard documentation of serious side effects of shelf dredging may well be due to inappropriate types of studies, not to the lack of number of studies themselves, or to the fact that such effects don't occur. Studies have failed to recognize the nature of the processes involved. Certainly, the very rigid, scheduled approach taken by the Corps of Engineers in its usual monitoring studies is unsuitable to answer dredge impact questions on continental shelves. We should be prepared to sample wherever and whenever a particular event dictates. The Corps approach to determining dredging effects fails to recognize both the probabilistic (event related) nature of the system, and is inevitably too short-term to be useful in recognition of long-term biological effects.

READING LIST

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STATEMENT OF GEORGE BANINO

BEFORE THE

HOUSE MERCHANT MARINE AND FISHERIES SUBCOMMITTEE ON

OCEANOGRAPHY, GULF OF MEXICO AND THE OUTER CONTINENTAL SHELF

AND THE

HOUSE NATURAL RESOURCES SUBCOMMITTEE

ON ENERGY AND MINERAL RESOURCES

JULY 26, 1994

Thank you for the opportunity to appear before you and testify on H.R. 3678 which would give the Secretary of the Interior the ability to negotiate agreements for the use of Outer Continental Shelf (OCS) sand, gravel and shell mineral resources.

I speak from my 24 years of experience working as a consultant to the construction aggregate industry throughout the United States, but with emphasis on the Northeast. I am also here representing the National Aggregate Association, one of the largest national industry associations representing manufacturers of construction aggregates and their suppliers. In addition, I am a member of the Department of the Interior's OCS Policy Committee and have recently been named as Chairman of its Subcommittee on OCS Hard Minerals.

This industry produces sand, gravel, crushed stone and shell for a wide variety of construction purposes and is one of our most basic natural resource industries. The ability to produce high quality, low cost construction aggregate is necessary to support our nation's growth and the expansion and maintenance of our infrastructure at a reasonable economic cost. Further, this mining industry must be able to produce its products in a way that minimizes environmental impacts and avoids land use conflicts to the greatest extent possible.

Traditionally, these mineral resources have been mined from land-based deposits. In heavily populated areas, particularly along our coast lines, the need for sources of construction aggregate close to their markets has created land use conflicts. Such conflicts have led to restrictive zoning, law suits and escalating permitting costs. In some areas, long established mineral deposits of construction aggregates have been mined out, creating the need to transport these high bulk materials long distances at high costs. Finally, in some areas, there are no suitable deposits for the production of construction aggregates, leading to the importation of these materials from other parts of the country or even from foreign countries.

It has long been recognized that alternative sources of construction aggregates, specifically sand and gravel, exist on the OCS that have the potential of meeting the needs for both land-based construction and for beach restoration. Two countries, Japan and the United Kingdom, have been leading the way in the use of OCS sand and gravel, where significant percentages of the construction aggregate needs are met by offshore

mining. By using those resources, these island nations reduce the demand on their land, and shift many of the environmental impacts inherent in mining away from their population centers. This is not to say that they are not concerned with environmental impacts. In both cases, such impacts have been studied intensively, and strict controls are imposed to minimize impacts on other natural resources such as water quality and fisheries. Experience has shown that the use of the mineral resources can be compatible with other natural resources.

The existing requirements for cash bonuses and bids to obtain the right to OCS mineral resources have proved suitable for oil and gas, but are inconsistent with the financial structure of the construction aggregate industry. This industry will want assurance that it has the ability to mine a particular site before it makes a large investment in exploration and development. In my own experience, the present bid system has discouraged construction aggregate industry members from seriously considering OCS resources.

H.R 3678 provides an alternative approach for the use of OCS mineral resources. By providing the ability to negotiate a fair agreement before extensive exploration and development costs are expended, the construction aggregates industry can consider OCS resources as an alternative to on-shore resources. In some cases, particularly along our coast lines, this can be a cost effective alternative.

The greatest use of construction aggregates is in road construction. Virtually all highways are built with Federal. state or local funding, and a lower cost source of these materials will lead to lower project costs. Many other large scale projects are funded to some extent or approved by Federal agencies, and they too would benefit from lower cost construction aggregates.

H.R. 3678 opens the way for the development of OCS mineral resources beyond oil and gas so that hard mineral resources on the OCS can serve the public interest. On behalf of the mining industry, I urge the Committees to act favorably on this bill.

I

103D CONGRESS
1ST SESSION

H. R. 3678

To authorize the Secretary of the Interior to negotiate agreements for the use of Outer Continental Shelf sand, gravel, and shell resources.

IN THE HOUSE OF REPRESENTATIVES

NOVEMBER 22, 1993

Mr. ORTIZ (for himself, Mr. WELDON, Mr. LEHMAN, and Mr. TAUZIN) introduced the following bill; which was referred jointly to the Committees on Natural Resources and Merchant Marine and Fisheries

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A BILL

To authorize the Secretary of the Interior to negotiate agreements for the use of Outer Continental Shelf sand, gravel, and shell resources.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. AMENDMENTS.**

4 Section 8(k) of the Outer Continental Shelf Lands
5 Act (43 U.S.C. 1337(k)) is amended—

6 (1) by inserting "(1)" after "(k)"; and

7 (2) by adding at the end the following new
8 paragraph:

"(2)(A) The Secretary may negotiate an agreement for use of Outer Continental Shelf sand, gravel, and shell resources—

"(i) produced in association with a navigation project, or for a construction project, funded in part by or authorized by the Federal Government; or

"(ii) for use in a program of shore protection, beach restoration, or coastal wetlands restoration undertaken by a Federal, State, or local government agency.

"(B) Outer Continental Shelf sand, gravel, and shell resources shall be made available under this paragraph for a fee determined by the Secretary, except that no fee shall be assessed for such resources used in connection with a project described in subparagraph (A)(ii) which is 50 percent or more funded by the Federal Government.".

STATEMENT FOR THE RECORD
OF
JEFFREY R. BENOIT
DIRECTOR
OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT
NATIONAL OCEAN SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

BEFORE THE

SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES
COMMITTEE ON NATURAL RESOURCES

AND THE

SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO
AND THE OUTER CONTINENTAL SHELF
COMMITTEE ON MERCHANT MARINE AND FISHERIES
U.S. HOUSE OF REPRESENTATIVES

JULY 26, 1994

The National Oceanic and Atmospheric Administration (NOAA), which administers the Coastal Zone Management Act of 1972 (CZMA) and the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA), has an interest in the proposed amendment to the Outer Continental Shelf Lands Act (OCSLA), and supports the amendment. Under the CZMA, which establishes a federal/state partnership for comprehensive management of the Nation's coastal resources through the National Ocean Service's (NOS) Office of Ocean and Coastal Resource Management (OCRM), coastal states and territories may have an interest in using Outer Continental Shelf (OCS) sand, gravel, and shell resources for certain coastal management projects. Also under the CZMA, federal activities that affect certain uses or resources in a coastal zone are required to be consistent to the maximum extent practicable with federally approved state and territorial coastal zone management

programs. Under the MPRSA, which protects resources within designated national marine sanctuaries, federal agencies are subject to a consultation process if activities occurring outside sanctuary boundaries are likely to injure sanctuary resources, and in some cases seabed mining within sanctuary boundaries is prohibited. Thus, NOAA has an interest in ensuring that OCS sand, gravel, or shell licensing activities do not endanger sanctuary resources.

Under the current language of the OCSLA, the Secretary of the Interior is authorized to grant leases for any OCS mineral other than oil, gas, and sulphur only on the basis of competitive bonus bidding. This arrangement does not provide optimum flexibility for state or territorial and local governments undertaking beach restoration projects or the access to OCS resources needed by the U.S. Army Corps of Engineers for congressionally authorized projects for coastal wetlands and storm damage protection. Meanwhile, onshore and nearshore supply sources of sand, gravel, and shell for such projects have diminished.

The legislation would amend the OCSLA to allow the Secretary of the Interior to negotiate agreements for the use of OCS sand, gravel, and shell resources produced in association with a navigation project or for a construction project funded in part by or authorized by the federal government, or for use in a program of shore protection, beach restoration, or coastal

wetlands restoration undertaken by a federal, state, territorial, or local government agency.

NOAA supports this proposed amendment to the OCSLA, because it will facilitate public works projects that enhance coastal management. It will do so by providing for the use of clean dredged materials for coastal wetlands and storm damage protection projects and for beach restoration/renourishment projects that preserve beaches and expand access to and public use of beaches. NOAA supports the effort to provide coastal states, territories, and federal agencies with a supply of sand, gravel, and shell resources for such beach and barrier island restoration projects in light of the decreasing availability of such resources in nearshore areas.

NOAA notes the need to be mindful of the following considerations:

Any OCS leasing process, including agreements for use of sand, gravel, and shell resources, should involve adequate consideration of all environmental issues and full participation of all interested parties as early as possible in the process. The process should include public hearings, interagency coordination (such as under the Fish and Wildlife Coordination Act), intergovernmental coordination (such as federal consistency under section 307 of the Coastal Zone Management Act), and

scoping meetings to fully review the matter and allow public input before a final decision is made on the agreements.

As a federal activity, leasing or other agreements for use of OCS sand, gravel, and shell resources would be subject to the federal consistency provisions under section 307 of the CZMA if any land or water use or natural resource of a state or territorial coastal zone were to be affected. Early notification and consultation among all parties is the most effective approach to meeting the requirement for consistency.

Consistent with the purposes of the MPRSA, most national marine sanctuaries prohibit some forms of alteration of the seabed. For example, the Stellwagen Banks National Marine Sanctuary specifically prohibits sand and gravel mining operations. Activities, such as disposal, taking place outside sanctuary boundaries that harm sanctuary resources may also be prohibited. Federal agencies proposing actions that are likely to injure sanctuary resources must consult with the Secretary of Commerce.

Also, to further the goals of both coastal zone management and ocean resource protection, some states and territories are undertaking ocean management planning efforts. As part of these efforts the states and territories may address minerals mining within their jurisdictional waters. Minerals Management Service (MMS) coordination with the planning process in these states and

territories is important and recommended. Furthermore, existing agreements with states and territories regarding mineral mining offshore should be recognized and incorporated if necessary in any agreements made under the proposed amendment.

Again, NOAA supports the proposed amendment because it facilitates the beneficial use of sand, gravel, and shell resources to advance the purposes of coastal zone management. We also feel strongly that the mining and use of these resources should be done in an environmentally sensitive manner and consistent with both state and territorial coastal zone management programs under the CZMA and national marine sanctuaries under the MPRSA. Thank you for this opportunity to comment on the proposed amendment.

83-315 O - 94 - 3

RESPONSE TO QUESTIONS
OF THE SUBCOMMITTEE ON OCEANOGRAPHY, GULF OF MEXICO, AND THE OUTER CONTINENTAL SHELF AND THE SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES
BY
GEORGE M. BANINO

1. What initiatives are being taken to interest private industry in OCS sand and gravel resource assessment and exploration? What is currently not being done that can be done?

Interest has been expressed by some members of the mining industry in the development of hard mineral crusts in the Pacific and in OCS sand and gravel resources, particularly along the Northeast coast. Past meetings on the subject, sponsored by MMS, have sparked interest, as shown by the large and enthusiastic turnouts. However, the prospect of going through a competitive lease sale similar to that used for the oil and gas industry has smothered the interest of the sand and gravel industry. This industry will obtain the mining rights to land before it makes any significant investment in exploration, environmental studies or resource development.

Past efforts by the MMS to modify the regulations to lessen the impact of the competitive bidding have helped to raise the interest of private industry, but these efforts have not been successful. The current attempt to change OCSLA legislation and allow the Secretary to negotiate leases will be of considerable interest to the sand and gravel industry and, if successful, renew interest in OCS mining.

To further raise the interest of private industry, a demonstration project should be considered for funding. Such a project would not only demonstrate the feasibility and economics of OCS mining, but also provide an opportunity to intensively study the environmental impact of such mining.

Legislation should also be considered to create a better method of dealing with exploration and resource assessment than that provided for in Section 8(k) of the OCSLA.

Ships with well demonstrated technology for OCS mining are available over seas, but the Jones Act prevents those ships from being used to meet domestic needs. Consideration should be given to providing a mechanism to use foreign bottoms to provide mineral resources for our economy.

2. What are the relative costs for onshore, nearshore and offshore sand and gravel resources?

The costs of producing onshore processed sand and gravel range from about $2.50 to $5.50 per ton nation wide, but tend to be higher in highly populated areas where there is greater competition for land and where environmental requirements are much more stringent. This is

true, for example, along the New Jersey, New York and New England coast lines where the cost of sand and gravel can be as high as $8.00 per ton.

Nearshore costs can be competitive with onshore costs, as is demonstrated by the supply of a considerable portion of sand into the New York City metropolitan area from a nearshore dredging operation in the state waters of New Jersey. The Army Corps of Engineers, as a rough guide, assumes a $1 per cubic yard ($0.67 per ton) increase in price for each mile further from shore when a floating pipeline is used to bring the sand onshore. Beyond about five miles, it would be more efficient to use ship or barge transport to bring the material either directly to shore or to discharge to an off shore hopper, as is done in the case of the nearshore New Jersey operation. Barge transport of aggregates is the lowest cost method of transportation for distances beyond about 30 miles. Transport costs along inland waterways are in the range of $0.03 to $0.05 per ton. Offshore barging costs are not known, but inland water barging costs suggest that this will be a relatively economical method of transportation. Ocean going barges have been used to carry crushed stone from Nova Scotia and Newfoundland to East coast ports, cement from New York to as far away as Savannah, and cement from Sweden, Spain or Greece to the East coast.

3. Can you specify some of the lessons that have been learned in Japan and the U.K. with regard to OCS sand and gravel resources?

OCS mining operations must be conducted in a manner to avoid adverse impacts on the coastline and coastline stability, be reasonably compatible with other users of the sea and the sea bed with respect to fishing and navigation, leave the sea bed reasonably similar to original conditions, and follow sound resource management practices to ensure maximum use of the mineral resources. Experience in both Japan and the U.K. have shown that these requirements can be met while providing competitively priced products to the coastal markets. In addition, extensive studies of the environmental impacts on the ocean waters, sea bottom and fisheries have demonstrated that the impacts are acceptably low when good mining practices are followed.

4. What types of ocean deposits would be preferable for construction use, as opposed to beach nourishment or coastal restoration?

Sand and gravel mined from the OCS will have to meet the same quality specifications as onshore material. Therefore, the source material will have to be similar to that mined on land. For construction purposes, the sand will have to have a broad size distribution, from fine to coarse grained. Deposits with excessive fine sand, silt and clay will be avoided because of the difficulties and expense of removing those sizes from the final product. Gravel would also have to have a reasonably broad range of sizes and be of good quality, consisting of quartz or other hard rock types. The types of OCS deposits that can be expected to provide such materials are glacial outwash deposits of various types and river terrace deposits. Such deposits are known to exist in the OCS and were deposited when the ocean was at lower level. These are the same types of deposits that are typically mined on land.

Other types of deposits that are unique to the ocean may also be suitable. These deposits may include shoals, sand ridges and ebb tide deltas, for example. The deposits must have been deposited in an environment that winnows out the finest grained sand, silt and clay while also allowing the deposition of a broad range of sand sizes.

5. How would the presence of silt or clay material affect the suitability of mined material? Would the finer materials need to be discarded, and where would a processing facility put it?

The issue of dealing with silt and clay generated by processing sand and gravel will be the same for both onshore and offshore sources. For any aggregate, regardless of its source, excess silt and clay exceeding from 1 to 2% of the material is deleterious to its performance and is unacceptable under specifications for most products. It is expensive and difficult to separate excessive amounts of silt and clay from sand and gravel, and handling of large amounts of these fine materials can be a problem. These factors lead the mining industry to avoid mining deposits containing more than a few percent of silt and clay because the costs quickly make the sand and gravel uncompetitive.

When sand and gravel are processed, the silt and clay are removed and usually carried into settling ponds along with the wash water. In many cases the fine grained sediments are allowed to fill the settling ponds or are pumped into previously mined out areas to back fill a portion of the mine. However, in other cases, the fine grained sediments are sold for fill material, for an additive to aggregate for asphaltic concrete or for mine reclamation purposes. There is also research being conducted into using such materials to improve the fertility and tilth of agricultural soils.

6. In evaluating offshore oil and gas tracts, many oil companies make sizable expenditures, before ever acquiring a lease. Why isn't it fair to expect sand and gravel companies to do the same?

Crude oil currently sells for about $123 per ton while sand and gravel typically sells for about $2 per ton or less before any processing. Therefore, the potential profits for oil and gas are significantly higher than what can be realized by the sand and gravel industry. Sand and gravel are high bulk - low value minerals that can not support the same level of financial risk as oil and gas.

Responses by Robert R. Jordan

to

Questions of the Subcommittee on Oceanography, Gulf of Mexico, and the Outer Continental Shelf and the Subcommittee on Energy and Mineral Resources

1. What costs has the State of Delaware incurred for beach nourishment?

Major beach nourishment projects have been undertaken in Delaware for many years. A variety of sand sources was used and some projects were emergency responses to severe storms. Precise records of costs for sand from State offshore sources are available from 1988:

Year	Placement Area	State Cost
1988-89	Fenwick Island, Bethany Beach, South Bethany Beach	$4,511,083
1992	Do.	2,029,183
1994	Dewey Beach, with minor projects elsewhere	2,812,376

The total cost to the State for the period 1988-1994 was $9,352,642. Please note that these are State funds only and only for Atlantic beaches.

2. How might you expect H. R. 3678 to affect future costs incurred by the state?

It is hoped that H.R. 3678 would reduce the public cost of acquiring beach nourishment sand below that expected under competitive bidding by permitting negotiation of a reasonable materials fee. Under current rules competitive bidding would be required; the normal effect of competition for a resource is to drive the price up. The anticipated benefit to worthy public projects assumes, of course, reasonableness on the part of the Secretary of the Interior.

The cost of sand from some alternative locations, especially on land, can be expected to rise thus making the comparative costs in the OCS favorable. The very availability of an option from the OCS should moderate costs.

3. Can you estimate Delaware's future sand and gravel needs for beach nourishment?

General estimates can be made based on experience. However, actual quantities required will vary with such factors as short-term beach migration rates and storm severity and recurrence interval. A study of Delaware's beaches by the Army Corps of Engineers is underway and is expected to produce reasonable estimates.

Recent experience suggests a requirement on the order of four million cubic yards in five or so years. Because of relative sea level rise, if it is decided to hold the position of the beach, the requirement per unit of time will increase significantly in the future if other factors remain essentially similar to the recent past.

4. In your testimony, you refer to issues at the interface of state and federal jurisdictions. Would you elaborate on some of these issues and what impact, if any, H. R. 3678 may have on these issues?

The issues are of a jurisdictional nature at an ancient artificial boundary based on the range of cannon. My experience has been primarily based on jurisdiction over geologic resources and the consequences of exploration and development of such resources. Although oil and gas production did not materialize offshore Delaware, we participated in all aspects of the federal leasing process and served on national bodies dealing with petroleum resources elsewhere. The most ready examples therefore derive from experience with oil and gas matters.

The case U. S. v. Maine et al. explored the fundamental jurisdictional concerns of the East Coast States and the federal government under the OCS Lands Act and the Submerged Lands Act. The States' claims to offshore jurisdiction derived from their Colonial charters was rejected by the Supreme Court, which effectively affirmed the OCS Lands Act. Issues were again raised in consideration of the Coastal Zone Management Act of 1972 and especially in the implementation of the Coastal Energy Impact Fund (CEIP) provisions of the Act. CEIP created boundary problems for those States, like Delaware, that lack formal agreements with their neighbors for the location of lateral seaward boundaries. Both interstate actions and imposition of boundaries by the federal Coastal Zone Management Agency proved highly contentious; in our case the latter was subject to significant litigation. More recently, the distribution of revenues generated from oil and gas near the State/federal

offshore boundary under Section 8(g) of the OCS Lands Act as amended created major debate. Much litigation has been pursued over OCS lease sales. "Consistency" under the Coastal Zone Management Act has been contested in and out of courts.

These resource examples could probably be supplemented by jurisdictional experience with fisheries and criminal law. The point is that the legislation under consideration for sand and gravel activities carries the potential for avoiding or reducing the confrontation that has attended other activities at the State/federal boundary.

5. Dr. Pilkey suggests in his testimony that there is difficulty in characterizing offshore sand and gravel resources. Where do you feel we are in terms of our ability to properly assess the nature and quality of offshore sand and gravel resources deposits?

Scale is an important consideration in assessing our knowledge of offshore sand and gravel. Our knowledge is unevenly distributed over the vast area of the OCS. Where detailed investigation has been motivated by potential economic benefit or by specific research interest, information is technically adequate. Other areas are known only in general terms. We do, however, understand the geologic processes operating on the continental shelf and the nature of the sediments of the shelf sufficiently to understand the potential for resources. Studies of the Atlantic shelf, for example, have been undertaken intermittently since the work of Stetson was published in 1938. The report of the Outer Continental Shelf Policy Committee, "U. S. Outer Continental Shelf Sand and Gravel Resources," concluded in part:

> Offshore supplies of beach nourishment sand and aggregate are sufficient to meet specific market demands and could provide sources environmentally preferable to onshore alternatives.
>
> The general distribution of offshore resources is understood, but there is a lack of sufficient site-specific detailed information to support development and proper decisionmaking.

Site-specific investigation would, of course, be both prudent and necessary to determine whether a particular deposit is a <u>resource</u> of the quantity and quality needed for a particular application and whether it can be obtained in a manner that is environmentally acceptable. The techniques applicable to site-specific investigation are well developed. Detailed bathymetry

is available for much of the shelf or can be easily obtained. High resolution seismic profiling yields significant information about the type, structure, and volume of prospective features. Sampling, especially vibracoring, can calibrate the geophysical information and provide samples for laboratory analysis. The shallow subsurface materials of the continental shelf can be assessed in essentially the same detail as the counterpart deposits on land. The nature of such investigations would not be much different from those accepted for offshore oil and gas facilities.

6. Do you feel that potential impacts from wave refraction, mud and silt migration and periodic resuspension can be addressed through environmental studies and mitigated under the current regulatory regime for mining of the offshore sand and gravel resources?

Changes in bottom configuration that might in turn affect wave refraction patterns and disturbance of sediment that produces turbidity should and can be addressed in site-specific environmental studies. Negative environmental consequences can be identified and mitigated by appropriate project design in most cases.

The propagation and orbital motion of water waves have been understood for many years. Waves indeed refract in response to bottom topography. Refraction patterns can be modeled and changes predicted if the bottom is modified. Because waves refract only where the bottom affects wave base, refraction is most significant in shallow water. This, along with the dynamic stability of the shoreface profile is good reason not to disturb the bottom close to shore and suggests a benefit to mining in relatively deep water well offshore. Wave refraction patterns can be predicted with reasonable certainty and negative effects avoided by the location and design of dredging operations.

Effects on biota of disturbance and suspension of bottom sediments producing turbidity in the water column is a subject deserving, and receiving from MMS, additional study. Fine-grained sediments (silt and clay) produce turbidity when disturbed and remain suspended and travel distances in the water column before being redeposited. However, deposits containing fine-grained sediment are undesirable for beach nourishment and would normally be avoided. Some control of turbidity can be exerted by the type of dredge employed; suction dredges, for example, are preferable to bucket dredges in this regard. Some turbidity is natural, especially during storms. The biota is, therefore, adjusted to normal sedimentary processes. The degree

to which it might be impacted by dredging operations is worthy of additional study. The OCS Policy Committee report on sand and gravel recommended enhancement of the MMS Environmental Studies Program to assure adequate understanding of biologic responses to dredging activity.

7. Some of the storms and hurricanes in the past few years have washed beach restoration projects back out to sea. Would pumping sand from farther offshore make any difference?.

There is nothing inherently more stable about a beach made of sand from distant offshore sources than from deposits close to shore. Understanding that beaches are dynamic, constantly adjusting features that must be altered by storms and other coastal processes, restoration projects are necessarily temporary. It is sometimes argued that an artificially restored beach damaged by a storm has met its intended purpose in absorbing the energy of the storm in the transportation of its sand thus avoiding or reducing damage farther inland.

The point of increasing the feasibility of obtaining sand farther seaward is to expand the search area to permit selection of the optimal sand with minimal environmental consequences.

8. Under the current legal regime for OCS sand and gravel, are opportunities being lost to provide low-cost materials for public benefit?

Sand and gravel are important mineral resources that are used in large quantities in many types of public works projects. The demand, in this instance for beach nourishment, is well established. Competing land use pressures, economics, and environmental considerations are clearly recognized as impelling the search for sand and gravel seaward. The fact that hard minerals are not being mined in federal waters is strong evidence of major impediments. As the OCS Policy Committee's sand and gravel report states, physical availability, market, and technology are all generally verified, but the regulatory framework is a significant barrier to the development of these resources.

9/2/94

83-315 O - 94 - 4

RESPONSE TO QUESTIONS SUBMITTED BY THE SUBCOMMITTEES CONCERNED WITH H. R. 3678 (OCS MINING FOR SAND AND GRAVEL)

by
Orrin H. Pilkey
James B. Duke Professor of Geology
Duke University
September 3, 1994

1. The proposed legislation, if passed, will allow MMS to study the long term effect of sources. However this is no reason in and of itself to pass the bill. A much more preferable approach is to understand the problem before beginning mining. Admittedly, this is not practical since at least a decade of observation is essential and in some hard ground environments as in South Florida, more than a decade will be required to determine the impact and recovery from shelf mining. Thus the critical thing is to make absolutely sure that such monitoring goes on and that it is competently carried out.

2. A good monitoring program should take into account two things: (1) the impact of shelf mining may be long term. Short term studies simply do not answer the questions of biological impact. (2) continental shelf environments are different from place to place. Assuming that the results from one type of continental shelf environment would apply to another is wrong. Continental shelf environments differ in a number of ways. The most important perhaps is the rocky shelf (South Florida, Onslow Bay, NC) with all of it's attached organisms versus the sandy shelf. Storminess is important also. Mud accumulating in the depressions left by mining on the shelf off New England would be frequently removed by storm waves. Mud in depressions off Panama City, FL might accumulate for a decade or two between big storms and thus when dispersed, the mud volume could be very large and the biological impact severe.

3. I am not aware of the details of the State/MMS agreements.

4. In my testimony I broadly outlined some of the potential environmental impacts of continental shelf mining. All of these could come to be but at our current state of knowledge it is impossible to assess how critical such impacts will be. Of course these impacts will very widely depending upon the type of shelf and the quality of the sediment being mined. There are a number of rumors to the effect that shelf depressions created by mining could be used as future garbage dumps or sites for brine storage. It should be assumed that almost anything that goes into a depression will come out

in some future storm. I believe it is important that the congress take steps to preclude the use of such sites for disposal purposes.

5.Computer models cannot predict the impact of dredging because we have only a rudimentary understanding of shelf dynamics, especially when it comes to storms. There are lots of biological questions as well. Our understanding of continental shelf oceanography is increasing rapidly and we have a fair qualitative understanding of shelf processes. But at the present time we cannot accurately predict the combined effect of waves and currents on sea floor sediment transport and deposition during storms. Garbage in and garbage out. The most sophisticated computer models fail when the input is poor.

6. Large scale development *should not* be promoted at this time. It is important to recognize that there are many uncertainties involved with OCS mining and until these are cleared up, mining should be restricted to essential situations and the operations should be carefully monitored for both biological and physical impact. It is essential that congress keep its pulse on it's operation and retain the power to halt mining should it be deemed unacceptably damaging. I believe, for example, there is a strong possibility that mining will be unacceptable along both sides of the Florida Peninsula.

7. As I understood the testimony given to the committee by MMS representatives, the current studies are far from adequate. In addition, MMS seems not to perceive the two principals that I outlined in question two above: the need for long range studies and the fact that studies conducted at one location don't necessarily apply to all locations. The evidence is that MMS does not have an appreciation of the complexity of the problem facing them. I believe that a National Academy of Science panel should be asked to evaluate the question of how to monitor for environmental impact.

8. I believe it is in the public interest to promote the use of OCS sand because it will release the environmental pressure on sensitive near shore environments already under siege from many directions. But this "promotion" must include a clear understanding on the environmental impacts of shelf mining and legislation must be strong enough to halt this industry where it can be shown to be damaging. It should not be an endpoint however. In many locations along our coastal plain, unused sand resources exist on land near the coastal zone. The impact of mining sand on land is much better understood than underwater mining.

9. It is important to note that very large volumes of sand will be needed for beach restoration at any given location. Sand emplaced on the beach is dispersed across the shoreface and cannot be used again for replenishment. Thus over a decadal time scale a beach may require the use of many millions of cubic yards of sand. There are many instances where offshore dredging has been accused of affecting the wave climate, causing increased shoreline erosion. Appropriate monitoring to convict the guilty party however has never been carried out. Off Grand Isle LA, a definite connection between dredging and shorefront erosion could be made because the very restricted dredging sites corresponded exactly to the location of erosion hot spots in the replenished beach.

10. Perhaps the best sand for use on a beach is the same grain size as the original or "native" sand. Failing that, a coarser sand might be best. Coarser sands produce steeper beach slopes which are not as attractive for family swimming (but better for surfers). Finer sands are said to disappear more quickly than native sands but I do not believe this is necessarily true. My examination of the national beach replenishment experience leads me to think that the frequency and size of storms is probably far more important in determining rate of beach loss than grain size. Mud in shelf sand is the most unacceptable component. Even a small amount of mud can be a problem because it is all released at once during beach emplacement.

11. Speaking broadly, near shore marine organisms on sandy shelves are adjusted to frequent and rapid changes in the bottom caused by storms. Offshore organisms on the other hand exist in an environment subjected to less frequent and lees important changes in the sea floor because in deeper waters the effect of storms is muted. This is one reason why it is so important to clearly understand the impact of offshore mining.

12. There probably have been an order of magnitude more oceanographic geologic and engineering studies of the surf zone environment than on the inner continental shelf. This is because the surf zone is both fascinating and accessible. On the other hand I believe that our level of understanding of the two environments is probably similar. The surf zone is immensely complex and the interaction of breaking waves and currents is poorly understood. The critical aspect of understanding these environments is understanding the processes of storms which do most of the "work" and it has proven difficult to obtain data in the teeth of these major events.

13. Since studies need to be long term to be useful, it may be unreasonable to expect the appropriate studies to be completed before mining begins. Another approach may be to allow mining at first, only on the least

biologically sensitive shelf areas and to observe the impact carefully. This would certainly preclude sand extraction from around most of the Florida Peninsula in the immediate future.

14. I have not studied the replenishment experience in New England. Outside of that area I know of a couple of instances along Great Lake shorelines where gravel replenishment was much more successful than previous sand replenishments. That is they were more successful if success is measured in terms of lifespan of the artificial beach. There is more to "restoring a coastline" than slowing the shoreline erosion down. Using gravel instead of sand may prove to have negative impacts for both the indigenous marine fauna and flora as well as for humans who use the beach.

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United States Department of the Interior

MINERALS MANAGEMENT SERVICE
Washington, DC 20240

SEP 29 1994

Honorable Gerry Studds
Chairman, Committee on Merchant
Marine and Fisheries
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

We are pleased to enclose responses to questions submitted to the Minerals Management Service as followup to the July 26, 1994, hearing on H.R. 3678, a bill authorizing the Secretary of the Interior to negotiate agreements for the use of Outer Continental Shelf sand, gravel and shell resources.

Thank you for the opportunity to provide this material to the Committee. If you have any further questions or need additional information, please let us know.

Sincerely,

Cynthia Quarterman
Acting Director

Enclosure

Identical letter sent to Honorable George Miller

cc: Honorable Jack Fields
Honorable Solomon Ortiz
Honorable Curt Weldon

1. What initiatives are being taken to increase interest by private industry in the Outer Continental Shelf (OCS) sand and gravel resource assessment and exploration?

The Minerals Management Service's (MMS) Marine Minerals Program has established joint Federal/State technical working groups. The joint management concept has facilitated coordination between Federal agencies, State and local governments, academia, industry and the public by providing a forum for considering the complex issues of seabed resources. Each joint Working Group identifies information and data needs relevant to marine minerals resources in its area; and carries out recommended activities and study projects. Such projects can include broad-based geological and geophysical data collection and regional resource assessment studies, environmental, mining technology investigations, and mineral economic evaluations. All participants are encouraged to share existing information and cost-share new resource assessment and exploration efforts. The results of all data collection, and scientific and other studies, are made available to the public. Such generalized studies can serve as valuable information for both the public and the private section; e.g., government organizations can use the information to assist in decisionmaking and planning, and industry can use the results of such studies as critical baseline information prior to planning costly investment in more detailed, site-specific studies and resource characterization.

Industry's perspective regarding the existing hard mineral legal framework, the Outer Continental Shelf (OCS) Lands Act, is that the competitive bidding requirement is a disincentive for them when considering investing in OCS resource assessment and exploration. The OCS Policy Committee in their recent report to the Secretary of the Interior on OCS sand and gravel resources also noted this impediment and recommended that the Department of the Interior (DOI) develop new legislation. H.R. 3678 addresses the issue of access to OCS sand, gravel and shell for public works projects. Because the private sector has some involvement in contract work implementing such projects (e.g., beach restoration and public highway construction projects), their interest in exploring for and investigating the potential of OCS sand, gravel and shell resources should increase. However, H.R. 3678 does not address private access to OCS resources for private use--the existing OCS Lands Act, section 8(k) requirements would prevail for such private use.

2. **Public perception of offshore sand and gravel resource development is a concern that must be addressed. What efforts are being taken to ensure public involvement in offshore mineral issues?**

The public is involved early-on in MMS's State/Federal cooperative efforts. Project activities are formulated, discussed and approved by consensus in an open forum. Scoping meetings and public hearings will also continue to be utilized where appropriate. For example, a series of meetings/workshops with Federal, State and local agencies, as well as industry, academia, special interest groups, and the public have been held to discuss viable use of Ship Shoal sand for future coastal restoration projects in south Louisiana. The use of demonstration projects is also being considered to build public confidence in existing technology and mitigation techniques that help to minimize environmental impacts.

3. **In your testimony, you refer to partnering with 19 States in addressing resource needs and development questions. Will you characterize the most common resource need and development questions?**

The most commonly identified resource need is for sand, gravel and shell for coastal restoration and construction aggregate. Development questions typically revolve around issues such as location, quantity and quality of the resource, access or conveyance, and economic considerations.

4. **Has the MMS worked with the coastal States in developing environmental studies that address OCS sand and gravel dredging issues, and can you explain the process that you use for identifying issues to study?**

Yes. MMS's cooperative projects with the coastal States typically include an environmental component as well as resource characterization work. The environmental studies normally focus on hardgrounds, benthic and biota populations, archaeologic assessments, etc. In most cases, the coastal States are very knowledgeable about what impacts need to be investigated, either from previous problem areas or needed extensions to ongoing studies. In addition, advice is also solicited from the DOI's OCS Advisory Board's Scientific Committee regarding environmental studies funded through MMS's Environmental Studies Program.

5. In what ways does the MMS insure that hard mineral development is carried out without harm to the environment? Would there be any significant change in your approach under this new authority?

MMS regulations concerning exploration, testing, development, production and processing activities under lease, state that such activities will only be approved once it is determined that adverse impacts can be avoided, minimized or otherwise mitigated. Section 282.28 of MMS's operating regulations for marine minerals relate in detail the environmental protection measures required in advance and during OCS developmental activities. Sale-specific and site-specific environmental evaluations are required to be prepared before review of mining plans. Sale- and operations-specific environmental evaluations are taken into account as well as air quality consequences of proposed activities. If the Agency's evaluation of the existing baseline information proves the data to be inadequate, then the Director will require that additional baseline data be collected prior to approval of the proposed activities. This section of the operating regulations also requires the lessee to monitor activities to assess the impacts of exploration, testing, mining, and processing activities on the environment on and off the lease. Other environmental provisions contained within this section guarantee that sound environmental protection measures are followed during all marine mineral development activities on the OCS. All of these in-place requirements serve to ensure that the MMS is complying with all requirements of the National Environmental Policy Act.

MMS is also making a concerted effort to anticipate potential environmental concerns and to address ways in which identified problems can be mitigated. MMS has initiated environmental studies well in advance of expected need. For example, in 1991, MMS contracted for a worldwide survey of environmental research to determine the extent of existing data on effects of offshore mineral development on the environment. The results of that study have pointed to specific areas that would benefit from additional assessment which MMS is pursuing through contracted studies: e.g. benthic organism repopulation, surface and bottom plume effects, wave climate modeling, technology evaluation and mitigation measures. MMS is approaching environmental questions very methodically and thoroughly. This cautious approach has been well received by our constituencies and will continue to be used to support decisionmaking for competitive leasing and negotiated agreements.

6. Is there general support for this type of public works legislation from your Agency's perspective?

The principal end use for OCS sand under negotiated agreements would be for beach restoration. Projects of this nature have been routinely completed for over 30 years. The Army Corps of Engineers (ACOE) typically dredges shelf sand and gravel from State waters. The environmental community participates in the decision process for beach restoration projects through site-specific environmental impact statement review. We are not aware of any past opposition to such projects, but rather observe public support for protection of the shore, and recreational and wetland areas. Given that OCS sand is plentiful, any concerns arising over a specific site should be quickly resolved by selecting alternative sites.

7. **As the regulatory and resource management agency for the OCS, what benefits do you see accruing from passage of H.R. 3678?**

MMS has noted that nearshore dredging in some cases has accelerated the loss of sand on renourished beaches, owing to a change in the wave and current patterns induced by the dredge excavation area. In some cases there would be an environmental advantage of dredging further from shore to avoid these physical oceanographic changes. In the United Kingdom and Japan, where substantial sand and gravel resources are obtained offshore, government policy favors dredging activities in deeper water.

Dredging three miles and beyond on the OCS may also reduce some visual impacts of operations. However, vessels used in typical dredging operations are not unlike many that ply coastal waters and are common to these areas. Where beach nourishment has been practiced for some time, we are unaware of major objections to the presence of dredge vessels and equipment. This may be due to the transient nature of projects, the fact that the operations mix in with other vessel traffic, or that the public is tolerant of operations because of the recreational benefits that accrue.

H.R. 3678 would provide States with another viable option for approaching their public works projects. The negotiated agreement process would help to eliminate the uncertainty that would otherwise face a State or local government in planning its project - if it were necessary to compete for the OCS resource under the present competitive bidding requirement.

Another situation which would be rectified by H.R. 3678 would be the case involving OCS sand and gravel dredged by the Army Corps of Engineers (ACOE) in Federal waters during channel maintenance. Under current law, such Federal sand could only be disposed of in the open ocean and not utilized for the benefit of a beach restoration project. This bill would afford the DOI with the ability to permit use of such channel sand for such a beneficial purpose thereby utilizing what would otherwise be disposed. This is consistent with a Congressional mandate to the ACOE to beneficially use channel sand.

8. **Do you feel that potential impacts from wave refraction, mud and silt migration and periodic resuspension can be addressed through environmental studies and mitigated under the current regulatory regime for mining of the offshore sand and gravel resources?**

Yes. First of all, as evidenced in European operations, wave refraction impacts are largely mitigated by using sand resources from beyond the wave base. This would likely be the case should OCS sand resources be used for beach nourishment. Also, mud pits are unlikely to be created during OCS operations in that the modern dredging technology employed for sand removal would not result in deep depressions or pits. In any case, the MMS plans on conducting site-specific biologic and physical studies in areas of potential development prior to sand removal to identify in advance any potential environmental impacts. The existing regulations would then allow the MMS to require operations to be conducted or mitigation employed to alleviate those expected impacts. Specific areas could also be placed off-limits to sand removal.

9. **Dr. Pilkey, in his testimony, has indicated potential concern that offshore mining and dredging activities may have impacts on wave refraction and cause mud accumulating depressions. Do you feel your studies will adequately answer these concerns?**

Yes. Removal of sand further away from the shore and the coastal zone, beyond the wave base, would serve to largely alleviate potential wave refraction impacts that are associated with removal of coastal and nearshore sand resources. As pointed out in detail in the completed MMS-funded worldwide marine mining literature search study, mud accumulating depressions are formed when a dredging operation involves a stationary dredge which stays in one location for an extended period of time. The document suggests that the use of modern dredges designed for beach nourishment, particularly those designed for deeper water depths such as on the OCS, which are not stationary and are continually moving while operating, significantly lowers the potential for formation of mud pits and depressions. Examination of the seismic data collected in conjunction with the ongoing MMS benthic repopulation study off the west coast of Florida supports this interpretation. The study area, in State waters off Egmont Key, dredged by a stationary clamshell dredger, clearly shows deep depressions which have been slow to fill in. By comparison, the area off Longboat Key, where a cutterhead suction dredge was used, does not show any deep depressions or offshore pits at all. This is also a topic being investigated by the scientific team involved in the MMS's marine mining technology and mitigation study.

The MMS also plans to conduct site-specific physical studies in areas of potential development prior to sand removal to identify in advance any potential wave refraction or potential environmental impacts on the physical environment. The existing regulations would then allow the MMS to require that operations be conducted or mitigation employed to alleviate those expected impacts.

10. Have you consulted other countries to see how they have minimized their environmental problems?

Yes. We have fostered communication and ongoing relationships with foreign dredging and marine mining companies. For example, we are about to embark on an environmental and technological study with ARC Marine in the United Kingdom, a primary supplier of offshore aggregate for the European market. This relationship has allowed us access to proprietary information and data previously unavailable. Also, one of the team members on the ongoing MMS-funded marine mining technology and mitigation study is a world-renowned marine mining engineer and consultant who is working on several overseas projects. His knowledge base is being employed during the conduct of the study.

11. In your testimony, you mentioned the MMS has continuing studies to look at the long term impact and recolonization capabilities of ocean bottom communities in dredging areas, to investigate impacts of shallow placer mineral recovery, and to evaluate mining procedures and technology. Will these studies be completed before any agreements will be negotiated for offshore mining programs?

The two studies that are most pertinent, the recolonization study and the mitigation study, will be completed in FY 95. MMS was not originally anticipating the culmination of any specific negotiated agreement until sometime in FY 95 at the earliest, if new legislation passes during this session of Congress. The ACOE indicated in its testimony that the Congressionally authorized shore protection project in the Myrtle Beach area would require a negotiated agreement for use of Federal OCS sand in the very near term to avoid delaying the project. It is not clear to the MMS, why identified State water sand deposits might not be used for initial phases of this 50 year project, if MMS National Environmental Policy Act (NEPA) compliance or other procedures should introduce unacceptable delay. Clearly, in the absence of new legislation, the MMS would be obligated to hold a competitive lease sale for the resources that the ACOE has identified in Federal waters. The MMS obligation to comply with NEPA requirements is not affected, whether the bill passes or not, and appropriate time would be allotted to meet the obligation.

12. **Do you feel that potential impacts from wave refraction, mud and silt migration and periodic resuspension can be addressed through environmental studies and mitigated under the current regulatory regime for mining of the offshore sand and gravel resources?**

This is a repeat of question 8.

13. **You mentioned several studies undertaken by MMS that are looking at various aspects of OCS sand, gravel, or shell resources development. What are the subjects of these investigations? Were they required by law or initiated voluntarily by MMS? What is the status of these studies? Please provide the subcommittees with any preliminary or interim reports that have resulted from these studies.**

The studies completed and ongoing studies in support of the MMS's marine minerals program are as follows:

Marine Mining Literature Study [FY 91-93 / $ 156,000]
Contractor: Continental Shelf Associates, Jupiter, Florida

[COMPLETED - Final Report Available] This WORLDWIDE study was concluded in March 1993 and provided some 300 references on the potential environmental impacts of marine mineral development. Over 90 of the more important citations were annotated and computerized.

Benthic Repopulation Study [FY 92-95 / $ 425,000]
Contractor: University of South Florida, St. Petersburg, Florida
[Ongoing - Draft Report Due April 1995, Final Report Due August 1995]

This is a multi-year study which is taking place at dredge sites south of St. Petersburg, Florida with the cooperation of the Army Corps of Engineers. The sites under study are being used for beach restoration projects (non-MMS) in the area. The objective is to determine effects on bottom dwelling organisms in the dredge area and the rate at which bottom communities will repopulate an affected area.

Marine Mining Technology and Mitigation Study [FY 93-95 / $ 160,000]
Contractor: Centre for Cold Ocean Resources Engineering, St. John's, Newfoundland
[Ongoing - Draft Report Due October 1994, Final Report Due January 1995]

This study involves an integrated group of marine scientists who are evaluating marine mining technologies for their potential impacts on marine and onshore environments. This team will then examine technological and other methods by which these impacts can be mitigated so as to permit certain marine mineral development to proceed with negligible or acceptable impacts or risks.

Pilot Marine Placer Mining Environmental Study [FY 93-97 / $ 60,000]
Contractor: Centre for Cold Ocean Resources Engineering, St. John's, Newfoundland
[Ongoing - Draft Report Due June 1997, Final Report Due September 1997]

MMS is participating in a pilot project being undertaken by the Canadian Centre for Cold Oceans Resources Engineering (C-CORE) which involves simulated gold placer mining and the monitoring of environmental effects. Sediment plume and biological studies (monitoring) will continue through 1997.

Benthic and Surface Plume Study [FY 94-96 / $ 100,000 MMS] [Total Value of Project Including Partner's Share: $303,400]
Contractor: Coastline Surveys, Limited, Bristol, England
Partners: ARC Marine (Dredging Company), Hydraulics Research (Modeling/Scientific Group)
Note: Participation by the UK Ministry of Agriculture, Food, and Fisheries (MAFF) and United Marine Dredging may be forthcoming.
[Ongoing - Year 1 Field Report Due October 1995, Year 2 Field Report Due October 1996]

This study is being conducted off the southern coast of England and involves the sampling and video recording of plumes created by the draghead and overspill devices. The objective is to develop some form of predictive capability of determining possible impacts on marine organisms, both within the water column and on the sediment surface. Participation by MAFF will result in an expanded site-specific biological monitoring and evaluation effort.

Wave Climate Modelling and Evaluation [FY94-96 / $ 177,000 MMS; $ 177,000 LSU]
[Ongoing - Draft Report Due May 1996, Final Report Due August 1996]

This study involves the use of numerical modelling to examine the current and wave fields around Ship Shoal, an offshore geologic feature located in the central Gulf of Mexico, and the adjacent Louisiana barrier islands. Ship Shoal is being considered as a source of clean quartz sand for beach replenishment along the rapidly deteriorating Isles Dernieres. The model will be used to help predict the resultant effects upon the wave and current field in this area, using scenarios involving various degrees and quantities of sand removal from the shoal.

All of these studies were initiated voluntarily by MMS in recognition of data needs in support of possible future marine mineral development on the U.S. OCS.

14. Does the MMS assert management rights over sand and gravel produced as a result of navigational dredging in the Federal OCS? Are such materials produced? Please cite current or past examples of such activities.

Yes, section 8(k) of the OCS Lands Act authorizes the Secretary to lease any mineral, other than oil, gas, and sulphur, on the OCS on the basis of competitive bidding. Whenever a mineral is removed from the OCS, it would be subject to management under the OCS Lands Act. The ACOE receives congressional authorization to conduct navigation dredging (which can extend out into the OCS), but in doing so, they comply with all existing laws and obtain appropriate approvals.

Typically in the past, when dredging offshore, the ACOE would identify material disposal sites (open-ocean or contained upland sites if polluted). In recent years, with mineral materials such as sand, gravel, and shell becoming increasingly scarce and costly onshore or nearshore, there has been a push to use this material, if clean. Congress has provided some direction in legislation to examine "beneficial use" possibilities, like placement on eroding beaches, for material dredged from channels. Likewise, industry recognizes the opportunity to obtain material from channels to sell or use in the private market.

Since the early 1980's, sand and gravel have been mined from the entrance to New York Harbor, in State-controlled waters. The operation helps maintain the Ambrose Channel for navigation for the ACOE, and the dredged material is processed and sold by the operator (Amboy Aggregates) for concrete aggregate in the New York and Connecticut markets, as well as for fill-sand for construction projects. The operation produces about 300,000 to 600,000 cubic meters of sand and gravel annually, under State permits or licenses. The operator pays a production royalty to the State of New Jersey (or to the State of New York when operating there) for each unit of material sold.

In 1992, the ACOE was approached by a dredging contractor willing to maintain a portion of a channel offshore South Carolina in exchange for use of the material for an onshore contract. Since the location of the desired channel sand was in Federal waters, MMS was unable to permit such removal because of competitive leasing provisions of the OCS Lands Act.

15. When assessing a fee for OCS sand and gravel resources under H.R. 3678, who would be charged--the non-federal partner or the federal agency participating in or funding the project? Would the value of the minerals be considered an in-kind contribution of the Federal government to cost of the project?

For use of OCS sand and gravel for beach restoration projects which are independently managed by individual coastal States, the Secretary could assess a fee on the State or local government organization managing the project (the State or local governments have indicated that they would levy some sort of tax to raise money to implement such projects). For ACOE-managed navigation projects where the dredge contractor wishes to remove sand from the OCS, the Secretary could charge a fee to the contractor (or, alternatively, negotiate a reduced project dredging cost for the ACOE--whichever method is appropriate). If the navigation channel sand is to be placed on nearby beaches, the Secretary could assess a fee (or waive the fee if other public interest is served) to the State or local government benefiting from the sand placement.

For congressionally-authorized shore protection projects which are managed by the ACOE in partnership with the State and/or local governments as "non-Federal project sponsors," assessment of a fee is more complicated. The non-Federal project sponsor is envisioned to be the responsible party for paying any fees assessed for use of OCS minerals. This arrangement would be consistent with the current ACOE practice which requires the non-federal project sponsor to obtain access to any lands, easements, and rights of way, including sand borrow areas, required for project implementation. However, the determination of when and how much of a fee would be appropriate is made more complicated because of the existence of various requirements for cost-sharing of ACOE projects. Requirements for project cost-sharing can provide for a Federal share of total project costs ranging from 50 to 100% (a typical Federal share for shore protection projects like Myrtle Beach, South Carolina, is 65%). Therefore, with this accounting practice, the Federal agency (ACOE) would be responsible for a large share (if not all) of the fee. However, H.R. 3678 states that no fee will be assessed, directly or indirectly, on a Federal agency. Thus, if the non-Federal sponsor is assessed a fee representing their "proportionate" cost of the sand, then the Federal "proportion" could in effect constitute an in-kind contribution to the project. It is very difficult to ascertain at this point precisely when or how any fees would be assessed. If general direction is established by legislation, the Secretary can respond to each case individually and answer congressional queries about any fee assessments more appropriately at the time of proposed mineral rights conveyance.

The ACOE apparently believes that the Secretary should waive fees when use of OCS sand is associated with congressionally-authorized projects. Their rationale is based, in part, on current ACOE policy which does not allow the States to assess a fee as part of "total project cost" for sand removed from State waters--therefore to assess a fee for use of sand from the OCS could be viewed as "inconsistent" and would likely result in the States arguing to assess a value for use of sand from State waters. Given that the vast majority

of sand used for current shore protection projects is from State waters, a change to the "no assessed sand value" policy, could end up increasing overall costs to the Federal government when totaling all shore protection projects because of new assessed costs associated with State sand.

This rationale may be important when it comes to determination of a fee for a specific case or time period; however, the option for assessing a fee should remain in legislation because such accounting policies, practices, and cost-sharing arrangements tend to evolve over time; and therefore, assessments of fees may not, in the future, have the same impact. When all public interests are factored, it may prove incumbent on the Secretary to assess a fee to ensure fair returns to the public for the rights conveyed. The determination should be case-specific.

16. **The Army Corps of Engineers testified that it would like access to OCS sand and gravel on a time scale that would not interfere with the completions of authorized Corps projects. Will MMS be able to meet the Corps' needs while fulfilling the requirements of NEPA and the OCS Lands Act?**

The MMS and the Corps have had preliminary discussions about the need to coordinate our responsibilities related to activities which affect the OCS. Both the MMS and the Corps must comply with relevant laws, like NEPA, in carrying out each agency's respective mission--MMS in conveying access rights to the mineral resources of the OCS, and the Corps in implementing their congressionally authorized navigation dredging and coastal restoration projects. In order to ensure timely coordination and prevent duplication of effort, the MMS has provided the Corps with a possible Memorandum of Agreement (MOA) which would outline each agency's respective responsibilities and address the matter of timely coordination and cooperation during the planning phases of any Corps project(s) that involves use of OCS resources. Such an MOA should help to ensure that OCS sand, gravel, and shell resources could be made available (as appropriate with existing environmental laws) on a schedule which enables the Corps to meet its deadlines for project completions. The MMS is committed to working with the Corps in a cooperative manner. Once the Corps has reviewed the MOA and provided information on their upcoming project needs and processes, the MMS will be able to ensure that the procedures and decisionmaking of the two agencies are successfully integrated.

17. If both a coastal restoration project and federally funded construction project wanted access to one particular deposit of sand or gravel, how would the Secretary determine who has priority?

A number of generalized studies and resource estimates show that the quantity of sand and gravel available on the OCS is vast. The only constraint is that the extent and economic recoverablity of these resources is generally not adequately mapped and quantified. Various estimates show hundreds of billions of cubic meters of sand and gravel on the OCS--a huge amount compared to national demand. Therefore, it is likely that suitable sand and gravel resources would be available to meet any competing "public works" demand which could emerge from passage of H.R. 3678.

Not all sand and gravel resources will be suitable for a particular beach restoration or public works construction project. Sand and gravel must meet stringent physical and/or chemical quality specifications, depending on the intended end use. If one site-specific deposit were to be identified for multiple competing uses, the Secretary would need to identify alternative suitable sources or make a determination on the end use for the specific deposit.

The key issue is "what is in the best public interest." Therefore, the Secretary would have to weigh many factors to make a decision. Depending on the circumstances, both projects could be given a quota and share the resource, the resource could be more compatible for one project than the other.

18. Has the MMS ever conducted an auction of an offshore sand and gravel deposit? If not, are there estimates of what private industry might bid for such deposits?

The MMS began a sale process in the 1980's for sand and gravel offshore Alaska to support oil and gas development (building gravel islands from which to drill). The sale was not held because of changing technology and/or use of inexpensive onshore materials.

There are instances of prices being paid for mineral rights to sand and gravel onshore, and for sand from a navigation channel in State waters. MMS estimates at this time that any upfront cash bidding would be small, but that the royalty rate required by MMS could be from $.15 to $.50 per cubic yard (perhaps up to $1 in very high commodity price markets). Commodity sales prices vary greatly around the country (e.g., $3.00 to $12.00 per ton, or more). Transportation is very costly, so the nearer the sand source to the market, the higher the economic returns, and the greater the government's share of value (royalty) can be. In the United Kingdom, aggregate sells for $8.00 to $11.00 per cubic yard, and government royalties have been from $.50 to $1.00 per cubic yard, representing about 5% to 15% of product value.

19. **Who would be the lead agency in performing an Environmental Impact Statement (EIS) for proposed mining areas? Would each area need to be assessed?**

In the case involving a congressionally authorized project, e.g., a shore protection measure, the ACOE and MMS would both have responsibilities for NEPA compliance. Sections 1501.5 and 1501.6 of the Council on Environmental Quality (CEQ) regulations discuss the establishment of a lead agency and emphasizes cooperation between agencies when more than one agency proposes or is involved in the same action. Section 1501.5 (c) discusses determination by letter or memorandum which agency shall have the lead and, in cases of disagreement, lists factors which are to be considered in making such a determination.

In the case of OCS sand being used for congressionally authorized ACOE projects, it is possible that a Memorandum of Understanding (MOU) could be established between the MMS and the ACOE regarding lead agency consideration or the preparation of joint EISs.

Should OCS sand be requested for a State-initiated project whether undertaken by the ACOE or a private company by contract with the State, MMS would be obligated to comply with NEPA and follow the CEQ guidelines which would apply to transfer of rights to OCS sand and the removal of that sand.

20. Does the MMS advocate conducting further studies of offshore mining? If so, what types of studies and how long would they take to complete?

Yes. The MMS will continue to conduct generically-oriented environmental studies, as well as site-specific biologic and physical studies in areas of potential OCS mineral development. It is hoped that many of these studies, particularly the site-specific ones, will be completed prior to any large-scale removal of resources.

21. Offshore sand is presently being used for beach nourishment, and the demand will increase significantly in the near term. How is the MMS addressing the need for more detailed assessment and characterization of OCS sand and gravel resources?

An important component and first step in all MMS cooperative projects is the identification and characterization of OCS sand, gravel, and shell resources. This work is typically accomplished by cost sharing with the coastal State involved, and utilizing the expertise, knowledge base, and resources of academia, industry, State and local government agencies, and other Federal agencies. Using this approach, MMS is able to leverage and maximize its limited resources to assess and characterize OCS sand and gravel.

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22. Under the current legal regime for OCS sand and gravel, are opportunities being lost to provide low-cost materials for public benefit?

Until recently, the issue of access to OCS sand and gravel to support public works projects was moot because of economic realities--material from the OCS was seen as too distant (i.e., too costly to transport) compared to other potential source material (onshore or from State waters). However, recently and increasingly, the OCS is viewed as a viable option for source materials for coastal projects because of depletion of sand and gravel from alternative nearby sources or because of possible environmental benefits of extracting material farther from shore.

To our knowledge, there has not been a case where opportunities were lost to provide materials for public benefit. However, the ACOE advises that, soon, sand and gravel from the OCS will be needed for their Myrtle Beach, South Carolina, beach replenishment project. Additionally, in 1992, the ACOE was approached by a private dredging contractor wishing to remove and use sand and gravel from below a navigation channel located on the OCS. Such a use could have resulted in a channel maintenance cost savings for the public (see response to question 23).

23. **In your testimony, you stated that H.R. 3678 will assist in resolving issues concerning the Corps' beneficial use of sand dredged from navigation channels in Federal waters and the Corps' access to Federal deposits of sand and gravel for use in coastal restoration projects. Will you elaborate on this statement?**

The ACOE and the MMS have been identifying situations where the competitive bidding requirements of the OCS Lands Act may be problematic for sand and gravel.

One situation involved access to OCS sand and gravel below the Charleston Harbor navigation channel. A private dredging contractor wished to remove and use this material, but the MMS was unable to permit this activity without a competitive lease sale under the OCSLA. With new legislation, the MMS would be able to determine if and when a competitive sale is appropriate for such conveyances. If competitive bidding were not appropriate, MMS could then negotiate an agreement with the contractor for removal of the materials, for a fee when appropriate, if the extraction is environmentally acceptable.

Other situations regarding access to OCS sand and gravel will involve the ACOE and/or State and local governments identifying sand and gravel materials to support beach restoration projects, such as Myrtle Beach. For reasons related to depleting alternative sources and protection of the environment, sand and gravel from the OCS will be increasingly identified as source material for such public works projects. With new legislation, MMS could ensure that governmental organizations would have access to needed materials, at affordable prices, without concerns of being strategically out-bid at a competitive lease sale, possibly resulting in the project not being undertaken because source materials are not available or are too costly.

24. What are the roles of the MMS, the Corps, and the States in the 10 current State/MMS cooperative projects. How will H.R. 3678 affect these projects?

The approach MMS has taken with its cooperative projects is one of making the involved coastal State a full partner in project funding, planning, studies, and decisionmaking. Other participants such as the ACOE serve as advisors and a source of support through their complementary work, existing databases and expertise. H.R. 3678 will provide an option for a mineral conveyance mechanism which may be more suitable than competitive cash bonus bidding when working with States on coastal restoration projects.

ISBN 0-16-046025-5

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